

Running head: IMPROVING QUALITY OF MEDICAL CODING DATA AT NHB

Improving the Quality of Medical Coding Data

at Naval Hospital Bremerton

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Abstract

The effectiveness of a health care organization's coding function is directly associated with the effectiveness of the organization. Health care organizations use information derived from the coding function in medical record completion, claims processing, organizational decision-making, and in many other important activities. Faulty structures and processes in medical coding may result in flawed outcomes, which in turn adversely affect organizational effectiveness. The purpose of this project is to assess Naval Hospital Bremerton's coding function and make recommendations to the organization's leadership about potential redesign of the function. The project employs a case study design that relies upon various sources of data. Data are gathered through structured interviews conducted at several healthcare facilities in the Puget Sound area of Washington State. The project's recommendations result from a synthesis of data analysis and the literature review. Recommendations include consolidation and reorganization of the current coding function, adding additional coding staff, re-focusing training efforts, and improving auditing practices. The study also calls for increased provider and clinical leadership involvement to emphasize the importance of coding and documentation accuracy to support workload accountability and, ultimately, to improve patient care.

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Introduction

Health care is a highly regulated and dynamic industry driven by changing consumer expectations, fiscal constraints, and increased competition. The fragile balance between the competing demands of quality, access, and cost is a constant challenge for health care administrators, consumers, and payers alike. A common thread linking these demands together is health information data. At the macro level, health information data is aggregated to measure population health and assess health care policy. At the micro level, health information data is used for measuring system, provider, and patient level quality of care; medical billing and claims; research studies; medico-legal issues; and, a host of facility and patient level health improvement initiatives (Aday, Begley, Lairson, & Slater, 1998).

While health information data comes from many sources, the richest, most complete source is the patient medical record (Lighter & Fair, 2000). The patient record contains a detailed documentation of each patient encounter. Therefore, the accuracy and completeness of medical record documentation is of paramount importance. The sheer volume of medical record data, however, limits its usefulness as a data source because of the time and resources needed to extract and convert the data into useful information for decision making (Lighter & Fair, 2000). To overcome this limitation, the health care industry has adopted

standardized code sets that convert medical documentation into more usable data formats. Because organizations are striving to describe patient encounters with increasing detail, code sets have evolved and have become increasingly complex. Although advances in coding precision have improved the ability of organizations to accurately account for numerous dimensions of patient care, they have also created an enormous challenge for providers.

To assist health care providers, a profession of specialized medical coders has evolved. Because professional medical coders fully understand medical coding classification systems, they complement providers by helping them transform clinical care into coding data. Although providers remain the cornerstone of accurate medical documentation and coding, their level of collaboration with medical coding professionals directly impacts the quality of health information data (Prophet, 2001). These data are increasingly being used to monitor and assess quality of care, meet regulatory and reimbursement requirements, as well as to support a host of clinical and business decisions (Prophet, 2001). Therefore, hospitals and other health care institutions that have sound processes in place to ensure accurate, timely, and complete medical documentation and coding, will have a distinct advantage.

The civilian health care industry has long understood how data accuracy can affect organizational survival. Without accurate medical documentation and coding, providers are not reimbursed for the care they deliver and they may face steep penalties for filing false claims (Moss & Schexnayder, 2001). However, adopting a narrow view of medical coding data as solely a financial mechanism fails to recognize the full potential of the coding data for other uses. Organizations can use coding data to assess performance, to evaluate workload, and to capture other important aspects of provider-patient encounters.

This lesson is currently being learned within the Military Health System (MHS) where the number of patient visits defines workload. Using the number of patient visits alone fails to account for patient acuity and level of patient visit intensity. Medical coding data more accurately describes the intensity of the patient visit and acuity level and links it more closely to the level of effort and resources used for each patient visit. Had the MHS adopted medical coding data as a means of measuring workload, instead of relying solely on the number of patient visits, the MHS may have prevented a long history of inaccuracies in workload measurement.

The impact of inaccurate workload measurement within the MHS became increasingly apparent in the mid 1980s when the Department of Defense (DoD) began to explore managed care as a

potential model for health care delivery. The military's initial attempt at managed care began with the Catchment Area Management (CAM) and CHAMPUS Reform Initiative (CRI) demonstration projects. Lessons learned from these projects led the DoD to begin implementation of its current managed care program, TRICARE, in 1995 (Baine, 1995).

Rapid change within the MHS following TRICARE implementation made it increasingly difficult for the services to develop accurate budget projections, which lead to several years of funding shortfalls. Despite a 9.5% decrease in the number of military treatment facilities (MTFs) and a significant decrease in inpatient and outpatient workload reported between 1994 and 1998, direct care costs were \$726 million over budget projections. In defense of these budget over runs, DoD and TRICARE Management Activity (TMA) officials commented that MHS downsizing did not decrease the number of beneficiaries using MTFs and that "workload data are not accurate" (Hembra, 1999, p. 15).

The pervasive problems of capturing accurate workload data also made it difficult for the MHS to determine the cost of medical readiness, to measure cost effectiveness of care delivery, and to ensure the appropriate mix of providers within each facility (Backhus, 1999; Baine, 1995; Hembra, 1999).

Additionally, inaccurate workload measurement made it increasingly difficult for the MHS to justify its Defense Health Plan (DHP) funding.

In 1998, in response to the increasing pressure on the MHS to better manage and account for its funding, the Office of the Assistant Secretary of Defense (Health Affairs) ((OSD(HA))) created an MHS optimization team. The team's initiatives included an increased focus on population health, facility reengineering and optimization of MHS resources. The MHS optimization team believed that development of a uniform system designed to accurately report and compare workload for care delivered in MTFs and through managed care support contracts would contribute to accomplishment of these important initiatives (Office of the Special Assistant for Optimization, 2000).

Developing a system to accurately compare MTF workload with workload delivered through civilian managed care partners, requires adoption of a standardized approach to workload measurement that is recognized by both military and civilian organizations. Workload measurement can be captured by data extracted from the military's patient information system, which is called the Composite Health Care System (CHCS). Data residing within this system can be used to track not only the number of visits, but also diagnosis, intensity of visit, resources used

and the procedures required for each episode of care. The challenge for MTFs is ensuring that data meets the tests of quality. The extent to which workload data reflects actual workload depends upon the degree of accuracy in medical documentation and coding. Accurate data can also enable health care facilities to better understand the needs of their patient population and assess quality of care. Perhaps even more importantly, it can add value to and improve patient care through better data-driven decisions.

Conditions That Prompted the Study

Naval Hospital Bremerton's (NHB) executive management perceives that the workload data collected and reported for its facility may be inaccurate in terms of aggregate visits as well as the type and intensity of each visit. Further, management believes the problems are due to inaccurate coding and shortcomings in the structure and processes of NHB's coding function. These shortcomings have several potential impacts. The facility may not be getting proper credit for the care it provides and it may be facing an increasing risk of third party billing errors, which could ultimately result in liability and stiff penalties for fraudulent claims. Inaccurate coding data can also lead to false conclusions in studies that focus on patient demand, organizational capacity, patient mix, and utilization. Poor data can also misguide medical research for

population health and physician profiling activities and can potentially impact hospital funding.

Other key issues prompting this study include a major change in the outpatient billing process, a change scheduled to begin in mid-fiscal year 2002. This change will require line item billing for outpatient services that are currently billed on a per visit basis. Line item billing may have the potential to increase claims revenue, however, it requires filing multiple claims for each patient visit instead of the current practice of filing a single all-inclusive claim. This places an increasing importance on the accuracy of medical coding because each service must be coded and billed for appropriately under the scrutiny of a third party payer (TRICARE Management Activity, 2001).

In addition to reviewing medical coding from a data quality perspective, NHB is also interested in determining the practicability of consolidating inpatient and outpatient coding. This will require isolating the coding function to evaluate the medical coding process and understand its relationship with other functions within the hospital. Finally, if consolidated, NHB is interested in ascertaining the most appropriate organizational design and positioning for medical coding.

Statement of the Problem

The problem to be addressed in this study is how to improve the medical coding function at NHB to improve the quality of medical coding data. This will include: (a) Identifying key functions and roles of the coding staff, and (b) determining the most appropriate organizational design and positioning of the coding function to facilitate improvement of data quality.

Literature Review

This literature review will investigate several important themes associated with medical coding. The review will include a history of medical coding and its role in shaping the health care industry. Next, the roles of coding personnel will be discussed. Finally, organizational design and positioning of the medical coding function will be explored.

Medical Coding

While pioneers of the quality movement such as Joseph Juran and Edward Deming were reshaping the way many industries conducted business, the health care industry lagged behind (Lighter & Fair, 2000). In the 1970s, as health care costs began growing out of control, the health care industry realized that in order to manage these costs it must be able to accurately measure and assess the factors contributing to these rising costs: Like other business industries, health care organizations increasingly adopted a variety of quality management strategies

and initiatives to control costs (Berwick, Godfrey, & Roessner, 1990). Medical coding played an important role in the health care quality movement by transforming volumes of medical record documentation into standardized data elements for statistical process control and quality improvement studies (Lighter & Fair, 2000).

The first formalized system to classify medical diagnosis into a common coding scheme dates back to 1893 and was known as the Bertillon Classification or International Classification of Death (ICD) (Schraffenberger, 2000). This system, now in its tenth revision, is still used today throughout the world with many countries adapting it to suit their specific needs. The United States currently uses the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9 CM) to classify inpatient and outpatient morbidity and assign codes to diagnoses and procedures (Whalen, 1998).

While ICD codes are primarily associated with diagnoses, a separate body of medical coding evolved to establish standardized medical terminology and codes to describe diagnostic procedures and services. One of the most familiar is the Common Procedural Terminology® (CPT) developed by the American Medical Association (AMA) in the early 1960s. After the AMA published the first edition of CPT in 1966, the CPT gained widespread use by physicians, patients and third parties. The

CPT provided a universal language for procedural terminology and was increasingly used for medical record documentation. In 1983, Health Care Financing Administration (HCFA), currently known as Centers for Medicare & Medicaid Services (CMS), adopted the CPT codebook as part of the HCFA Common Procedure Coding System (HCPCS) and mandated the use of CPT to describe services under Medicare Part B (American Medical Association, 2001).

Other coding classification systems were developed to address the resources used and the costs involved in treating patients. One widely known classification system is the Diagnosis-Related Group (DRG), which Yale University originally developed in the 1970s (Fetter, Freeman, and Mullin, 1985). In 1983, to curtail skyrocketing health care costs, CMS adopted the use of DRGs as part of its prospective payment system (PPS) for hospital inpatient stays (Jacobs, 1991). Other systems include the resource based relative value scale (RBRVS), Ambulatory Payment Classifications (APC), and Evaluation and Management codes (E/M), among others.¹

Regardless of the number, complexity and constant changes of these coding systems, health care providers are still held legally accountable for accurately coding and appropriately

¹Although coding systems are often used to bill for medical services, the validity of the codes for this purpose is uncertain. Some studies suggest that DRGs account for only about 27% of the variance in average length of stay (ALOS) for inpatients and are not by themselves a sufficient predictor of hospital costs (Horn et al., 1991; Rhodes & Sharkey, 1995).

documenting the provider-patient encounter. Despite these legal requirements, an Office of Inspector General (OIG) audit report of 1996 CMS payments revealed errors in 30% of all Medicare fee-for-service (FFS) claims: These errors resulted in an estimated loss of \$23.2 billion (Mangano, 2001). In response to the findings, Congress, CMS, the Department of Justice and OIG began several initiatives to eliminate Medicare fraud. Many of these initiatives, based on provisions outlined in the False Claims Act, have been incorporated into new laws such as the 1996 Health Insurance Portability and Accountability Act (HIPAA), and the 1997 Balanced Budget Act (BBA). These laws hold health care providers accountable for fraudulent claims against government funds and levy steep penalties for noncompliance with regulations (Prophet & Hammen, 1998). The error rate for Medicare fee-for-service claims has decreased dramatically since these efforts began. However, the fiscal year 2000 OIG audit report still identified errors in 6.8% of Medicare claims equating to an estimated loss of \$11.9 billion. The OIG report concludes that over half these errors were the result of coding errors and documentation deficiencies (Mangano, 2001).

Although medical coding has been instrumental in providing a means for the health care industry to define services and measure and control costs, medical coding is an inexact science. Overlapping or clinically interrelated diagnosis codes often

result in disagreements on proper code assignment among providers and between experienced coders (Iezzoni, 1997). Complexities of the coding system and lack of training are often cited as reasons for these coding inconsistencies (King, Sharp, & Lipsky, 2001; Moss & Schexnayder, 2001). In order to prevent the risks associated with substandard documentation practices, most providers rely on training and guidance provided by health information management professionals who fully understand coding classifications (MacDonald, 1999).

Coding Personnel Roles

The role of medical coders, commonly referred to as health information managers, has grown considerably since their early days as medical record librarians. Medical coders have, however, retained their primary roles as educators and consultants (Borges, 2000). In an operating environment where new buzzwords like unbundling and upcoding are commonplace and where physicians tremble at the thought of fraud investigations, the role of medical coders as educators has gained in importance (Prophet & Hammen, 1998). The importance stems from medical coder's knowledge of proper coding procedures and their ability to identify and prevent improper or unethical coding practices. Not surprisingly, having an ongoing education and training program to ensure ethical business practices and eliminate fraud is a key component of the Department of Health and Human

Services (DHHS)OIG compliance plan guidance for hospitals
(Department of Health and Human Services, 1998).

Although DHHS (OIG) compliance plan guidance for hospitals addresses many aspects of a health care organization's business practices, the primary focus is on the revenue chain. Medical coders are a vital link in this chain due to their role in transforming medical documentation into codes used for billing. Because of their knowledge in many areas of compliance including documentation requirements, ethical coding practices, legal billing requirements, and their ability to navigate the regulatory waters of reimbursement, many organizations prefer to include coding personnel in the development and implementation of corporate compliance programs (Hammen et al., 1999).

Human Resources

To effectively make an impact on the quality of medical coding data-and to identify areas for improvement in education, auditing, and compliance-requires the right people in the right place with the right skills. Health information managers generally fall into one of three categories: coding specialists, health information technicians, and health information administrators. Each category carries with it certain knowledge, skill sets, and abilities.

Coding specialists provide the most basic level of health information management (HIM) support to health care

organizations. These specialists acquire job-related skills through on-the-job training and are typically not required to possess any formal education beyond high school. Coding specialists often specialize in either inpatient or outpatient records and have a basic knowledge of medical terminology. They are skilled in classifying data from patient records and applying proper sequencing of ICD, CPT and other commonly used code sets. They also know the legal, documentation, accrediting and regulatory body requirements for medical records and the HIM professional practice standards. Medical coding specialists usually report to the director of the HIM department.

Health information technicians are mid-level HIM personnel and most have a two-year HIM degree. In addition to possessing the skills of coding specialists, health information technicians have expertise in health information security systems, qualitative and quantitative auditing and monitoring techniques, clinical computer systems, and compliance issues. They are often responsible for developing in-service and other HIM training programs that address record completion, confidentiality and documentation standards, and procedures for correcting errors. Health information technicians are frequently placed in management or supervisory positions in smaller to mid-sized facilities. In these positions, they may carry out typical management functions, such as development of policies for the

HIM department, as well as various oversight functions in operational human resource management, such as training and development. Additionally, they ensure coding resources, such as reference books, are kept up to date and provide input regarding clinical information system changes and future planning. Health information technicians may also serve as members of quality assurance and corporate compliance committees.

Health information administrators, the highest level of HIM personnel, generally hold a bachelor's degree in health information management. They often work as consultants or directors of HIM departments in mid-size to larger facilities. In addition to having the skills of lower level HIM personnel, health information administrators often have a broader knowledge of compliance issues and the reimbursement system. Because of this broad knowledge base, health information administrators have the ability to integrate clinical documentation, coding, and billing processes. As consultants, they are often used to help coordinate the transition from a paper to an electronic medical record, provide team building and training programs, and evaluate an organization's HIM system (Dougherty, 2001).

Staffing of an HIM department depends largely on the size of the facility, type and number of records to be coded, record conditions, and the duties of the HIM staff (Dunn & Mainord, 2001). While the size of the facility and number of records to

be coded may be difficult to change, duties of the HIM staff, including time spent preparing records for coding, are much more flexible. Because these factors directly affect coder productivity, they are important determinants of coder staffing levels. Table 1, adapted from a recent survey conducted by Dunn & Mainord (2001), shows coder productivity ranges when accounting for coder responsibilities and record type.

Table 1

Productivity Ranges for Medical Coding Personnel Based on
Responsibilities and Record Type

<u>Record Type</u>	<u>Expectation/Day</u>	
	<u>Multiple Tasks</u>	<u>Coding Only</u>
Inpatient	19	23
Observation	24	32
Ambulatory Surgery	29	30
Minor Procedures	37	44
Outpatient Tests	161	230
ER Visits	83	106
Clinic or Office Visits	70	108

As shown in Table 1, the range of records coded on average per coder each day can vary considerably from one health care organization to the next. Because each organization has a unique operating environment with its own coding processes and its own set of coder responsibilities, no single set of productivity

standards will fit every organization's needs. It is important, however, that facilities have a benchmark when developing or assessing facility-specific coding productivity standards.

Training

Physicians are highly educated in the clinical practice of medicine. Unfortunately, their medical education does not prepare them for the labyrinth of regulatory and reimbursement requirements necessary to move from patient to payment (Austin & Stanfill, 2001). The lack of training in coding amongst physicians was highlighted in a study of nearly 500 family physicians, a study which found that only 63% had ever received any CPT code training (6 hours on average) and of those, only 37% had received any CPT code training since their residency (King, Sharp, Martin, & Lipsky 2001). Not surprisingly, when the coding by these physicians was compared to that of expert coders, the coding agreed only 55% of the time for established patients and only 17% of the time for new patients. The lack of a concerted effort to educate physicians on coding may explain why as of 1999, OIG inspectors had recouped over \$75 million in payments for coding errors from six teaching institutions (SoRelle, 2000).

Lack of education, however, does not relinquish a physician's responsibility for complete, accurate, and timely medical documentation and appropriate code selection (Moss &

Schexnadyer, 2001). Improving coding accuracy entails close collaboration and communication between physicians and coding specialists (Prophet, 2001). Placing coding professionals at the point of care to work closely with clinicians is one way of fostering this collaborative effort and has been found to have a positive impact on coding accuracy (Danzi, Masencup, Brucker, & Dixon, 2000).

Coding accuracy may also depend upon the effectiveness of training programs. Hammen et al. (1999) suggest that training effectiveness may be positively impacted through implementation of best practices. These practices, such as identification of physician champions, solicitation of physician input to support the training effort, and implementation of focused training programs in OIG deemed high-risk areas, may result in substantial improvements in coding accuracy that would otherwise not have been achieved. Other best practices include limiting group-training sessions to no more than 45 minutes and focusing on high-use, high-error codes specific to the audience (Fletcher, 1999). According to Hammen et al. (1999), training plans should include ancillary and support staff as well as other organizational members involved in the coding process.

Finally, plans should incorporate ongoing proficiency training for coding staff; particularly since a large percentage of hospital personnel performing coding duties are trained on-

the-job (Dunn & Mainord, 2001). Training plans should ideally address coding trends, discuss reimbursement and regulatory changes, and present critical implications of these trends and changes.

Auditing and Monitoring

The uses for medical coding data continue to grow (Driggs & Zupko, 2000; Prophet, 2001). Because numerous managerial and clinical decisions are based on medical coding data, the timeliness, completeness, and accuracy of the data are of paramount importance. Therefore, the reduction of coding errors through improvement of these data dimensions should serve as the foundation of a medical coding department's auditing program.

To facilitate a better understanding of coding errors, some researchers have developed classification schemes that provide a framework for understanding the origins of these errors. Driggs & Zupko (2000) classify coding errors into clerical, judgmental, and systemic categories. Clerical errors are usually caused by careless mistakes and are generally random and infrequent. Judgmental errors generally stem from subjective or decision-making mistakes and are usually indicative of inexperienced coders or training deficiencies. The last type, systemic errors, is the most serious because it often involves a pattern that can affect all records across the organization. Systemic errors are

generally discovered through trend audits and are the focal point of OIG investigations.

Record audits are a common method of uncovering clerical and judgmental errors and, according to Driggs & Zupko (2000), are most effective when done concurrently or before a record reaches the billing department. A popular methodology used to conduct trend audits and evaluate interventions using run or control charts is Schewart's Plan-Do-Study-Act cycle (Lighter & Fair, 2000). Rulon & Tully (2000) employed a modified version of the Schewart cycle, which they termed the input-process-output model. They used this model to build a clinical process audit program for Oxford Health Plans.

The frequency, type and scope of medical coding audits can vary depending on organizational needs and resources. Audits can be performed manually or by using auditing software; they can be contracted out to auditing firms or be performed in-house; they can be performed by a single department or by multidisciplinary teams; or, they can be performed by a combination of these approaches (Jeffries, 2001). Whatever approach is used, organizations must understand the nature of the data being audited and apply the proper statistical process control tools to produce useful information and direct appropriate interventions (Lighter & Fair, 2000).

Organizational Design

Organizational design is the process by which an organization aligns its resources to improve effectiveness and adaptive capacity (Shortell & Kaluzny, 2000). From individual positions to multiple organizational entities, the process can involve varying numbers and levels of organizational elements. Many textbooks that discuss organizational design emphasize that design should flow from an organization's strategic plan and support the organization's strategic goals (Ginter, Swayne & Duncan, 1998; Jackson & Schuler, 2000; Shortell & Kaluzny, 2000). According to Shortell and Kaluzny (2000) other factors that should be assessed before designing or redesigning any part of an organization include the corporate culture, current organizational structure, political processes and environment. Additionally, Worthley (1999) emphasizes the importance of ethical considerations when making decisions about organizational design and the resulting impact the design may have on the corporate culture.

Although the literature revealed very little on organizational designs for HIM departments, several articles addressed the increased accuracy of medical documentation and coding attained when coders work closely and collaboratively with physicians (Danzi, Masencup, Brucker, & Dixon, 2000; Stavely, 2000). Other stakeholders have made specific

recommendations about the nature of the reporting relationships between key individuals involved in the coding process. The American Health Information Management Association (AHIMA), for example, recommends that the head of the HIM department report directly to the facility administrator or executive director. Such a reporting structure may prevent undue influence or inappropriate use of medical record data by one discipline or department over another when making decisions that impact the entire facility. This is important since much of the information and data extracted from the medical record is used for analysis that directly influences decisions about the overall clinical and administrative management of a health care facility (Dougherty, 2001).

Additional insight into organizational design of HIM departments and the philosophy behind the designs is covered in the external organization interview section of this study.

Purpose

The purpose of this graduate management project is to identify variables that impact the quality of workload data being reported by NHB and to develop recommendations for improving the effectiveness of the medical coding function. The project will include an examination of the structure and processes associated with the coding function at NHB and will include a review of coder and medical staff training plans and

auditing techniques. Best practices in coding and potential changes to the current organizational design will also be explored.

Methods and Procedures

This project employs a case study approach that follows the techniques and protocols described by Yin (1994). According to Yin, a case study research strategy is appropriate for evaluating programs and conducting exploratory studies using multiple sources of evidence. This study is a single-case design that employs a semi-structured interview approach to data collection. Interviews were conducted in person where feasible and consisted of a series of focused questions related to staffing, training, auditing, and organizational design of each facility's coding function (See Appendices A through C). Information gathered through these interviews was reviewed and evaluated to identify prevalence and variations of coding function practices.

The units of analyses consist of the medical coding functions of Naval Hospital Bremerton and other health care facilities located in the Greater Puget Sound area of Washington State. An attempt was made to select hospitals similar in size and scope of services to Naval Hospital Bremerton. In order to expand the breadth of the study, however, medical centers, other military treatment facilities, veteran's administration

hospitals, and civilian for profit and not for profit hospitals were also included in this project.

Next, working with NHB functional area experts and other stakeholders, the findings were evaluated to identify practices that offered the greatest potential for improving the quality of NHB's medical coding data. Supported by a cost benefit analysis, the study concludes with recommendations to NHB management on changes aimed at improving NHB's medical coding function.

Multiple sources of evidence were used to identify key variables impacting the quality of medical coding data. These sources include interviews and an in-depth literature review. A chain of evidence was developed linking the findings from the data collection to the research question and ultimately to the final recommendations.

It was beyond the scope of this project to evaluate the validity or reliability of medical coding data. Additionally, as medical coding is an evolving and inexact science with disagreements even among experienced coders, the level of expertise and individual judgment of the auditors limit data accuracy and auditing results. These factors may differ greatly among facilities and have a varied impact on data quality. Therefore, explanation building aimed at establishing a logical link between coding practices and data quality is the primary basis for improving the internal validity of this study.

External validity can be judged by the study design and the analysis of the study's findings. Generalization of this analysis for use in similar studies is dependent upon an investigator's acceptance of the study design and conclusions drawn from the findings. The study design may be applicable for other program evaluation studies where program effectiveness is difficult to measure using statistical analysis.

The use of focused interviews increases the reliability of study results. The findings derived from the interviews are made available in the discussion section of this study. However, names and other identifying information about individual cases have been removed to maintain the anonymity of case participants. The purpose and use of the information gathered during interviews was explained to each case participant. Strict adherence to this protocol was followed in an effort to alleviate ethical concerns and encourage forthcoming dialogue during interview sessions.

Expected Findings and Utility of Results

This project will focus on several key dimensions of NHB's medical coding function. The project will specifically focus on staffing, training, and auditing procedures: An evaluation of these specific functions will then be couched in terms of strengths and weaknesses of the coding function at NHB. The end product of this study is a tool in the form of recommendations

for use by NHB's executive management to aide them in making decisions and evaluating changes to the hospital coding staff's training and auditing practices, staffing needs, and organizational design.

Discussion and Findings

Background

U.S. Naval Hospital Bremerton (NHB) is a 77-bed community based acute and obstetrical care facility located in the West Puget Sound area of Washington. In addition to its operational role as the home of Fleet Hospital Bremerton, NHB hosts a family practice Graduate Medical Education (GME) program supporting 18 residents. Naval Hospital Bremerton is one of three hospitals, seven DOD clinics and four U.S. Coast Guard clinics making up TRICARE Region 11. The hospital serves a catchment area of approximately 60,000 beneficiaries and has an annual budget of \$45 million. Inpatient workload for NHB is provided through an obstetrical care/maternal child ward, a multi-service ward, and an intensive care unit. Aggregately, these wards support care for over 3,000 admissions annually. Outpatient care is delivered through four primary care clinics, three outlying branch clinics, several specialty clinics, and the emergency room. Combined, these clinics support nearly 285,000 outpatient visits annually. Additionally, the hospital has an ambulatory care unit where roughly 1,800 outpatient operative procedures are

performed annually. The figures above reflect reported workload obtained from CHCS for fiscal year 2001. These figures include specialty care and inpatient support provided to military personnel assigned to ships ported at the Puget Sound Naval Shipyard and care provided to other eligible beneficiaries enrolled to civilian primary care managers.

In mid-fiscal year 2002, the MHS will be transitioning to line item billing for all outpatient visits. Line item billing requires multiple bills to be created for each patient visit where previously organizations generated a single bill per patient visit. Each MTF is responsible for providing qualified personnel and establishing essential processes in order to accommodate outpatient line item billing. The additional workload created by line item billing will place an added strain on NHB, which recently lost one of only two authorized outpatient medical coders. This position has been unfilled since August 2001. The sole remaining trained coder assigned to outpatient coding is also tasked with providing coding and medical documentation training, auditing outpatient coding, and accounting for outpatient workload. Due to the large volume of outpatient visits at NHB, the trained coder reviews only family practice visits. This review process is designed to ensure that codes are entered into CHCS through the automated data system (ADS) for each visit and not necessarily whether coding is

accurate or properly documented in the health record (B. Harris, personal communication, October 17, 2001). The outpatient coder resides within the Business Office under the Director of Resources (DOR).

Because training is one of the primary duties of the outpatient coder, the outpatient coding and documentation training program at NHB is quite robust. Although turnout for the training sessions has historically been poor, training on outpatient coding is offered to groups of providers generally on a bi-weekly basis. In addition to scheduled training sessions, the outpatient-coding trainer also offers individual training sessions to providers upon request. Historically, the highest demand for these training sessions tends to occur as physicians near the end of their military service and are preparing for civilian practice (B. Harris, personal communication, February 22, 2002). Although training is typically conducted using the assigned outpatient-coding trainer, NHB has used guest lecturers in its training program. In February 2002, a physician lecturer was brought to the hospital to provide a two-day coding course that focused on emphasizing proper documentation. While the course was well attended, the outpatient-coding trainer noted that many of the providers that needed the most help on proper coding and documentation, were absent from the training.

Although training is conducted on a frequent but irregular basis, auditing of outpatient coding is performed once a month. The Bureau of Medicine and Surgery (BUMED) requires each facility to randomly select 15 outpatient records per month. Coders assess these records for coding accuracy and report results back to BUMED. Several weaknesses are inherent with the current outpatient auditing process particularly at the facility level. First, NHB selects its 15 records from one clinic each month to assess the clinic's coding accuracy. Naval Hospital Bremerton then uses the results to gauge training needs for the clinic's outpatient coding. The potential for coding errors can vary dramatically across departments because the number of codes used across departments varies dramatically: Some departments, like family practice, may use a large number of varied codes while others, say physical therapy, may rely on very few. Therefore, when BUMED receives the monthly reports it may falsely determine that coding accuracy changes dramatically from month to month. Second, because only 15 records are pulled each month and because the number of monthly visits varies greatly from one clinic to the next, the 15 records, as a percentage of total visits for each clinic, will yield results with varying statistical validity. Finally, even if each monthly sample of 15 outpatient records were a representative sample, it would take a

much larger sample size to yield results with an acceptable confidence level and confidence interval.²

Inpatient coding for NHB belongs to the patient administration department under the director for administration/operations (DFA/O). The inpatient coding staff consists of five full time coders and the section leader. In addition to coding, this section also includes transcription, medical boards, and inpatient medical records. Inpatient coders at NBH code all medical records involving inpatient stays and ambulatory care operative procedures. The coders' duties include record assembly, physician queries, abstracting, sequencing, and coding. The patient administration department also has cognizance over 19 personnel assigned to NHB's outpatient records division (L. Tran, personal communication, October 9, 2001).

Training for inpatient coding is conducted as needed and is primarily directed toward the coding staff. In an effort to improve the medical record's condition prior to records reaching the coding section, the inpatient coding staff occasionally provides training to personnel assigned to NHB's inpatient

²Using the sample size formula $n = \pi(100-\pi)/(\sigma_p)^2$ where n = sample size, π = expected percentage of records with errors (for unknown error rates $\pi=50$), and $(\sigma_p) = 2.55$ reflecting an error rate within +/- 5% of the true value at a 95% level of confidence. Even a small facility such as NHB that only conducts approximately 23,750 outpatient visits per month would require a sample size of 385 records to obtain results within +/- 5% of the true accuracy rate at the 95% confidence level (Sanders, 1995).

departments. The inpatient coding section does not currently provide inpatient-coding training to physicians.

Auditing for inpatient records is very similar to outpatient records. Fifteen randomly chosen records are audited each month to evaluate coding accuracy. Since these records are drawn from among all inpatient and ambulatory procedure visits during the month, the sample is much more likely to be representative of the population than the records drawn for the outpatient sample. However, unlike outpatient records, inpatient records are more difficult to audit because multiple codes and code sets are used for each record. Although, audits have consistently shown a much higher accuracy rate for inpatient coding than for outpatient coding, a sample size of 15 records out of the 400 average monthly discharges will not yield sufficiently precise results to assess coding accuracy.

Interview Case Overview

Of the eight health care organizations that were originally identified and contacted to participate in this study, six agreed to take part in a two to three hour interview regarding its respective coding function. Most interviews were conducted with either the facility's lead coder, the head of the HIM department, or both.

Each interview began with a brief overview of the topics to be covered, the intended use of the information gathered, and an

assurance that facility-specific identifying information would not be used in the final report. Interview questions followed the order outlined in Appendix A. Tables C1 through C6 in Appendix C contain individual interview findings. The following sections discuss interview findings and frame these findings relative to the literature and current practices at NHB.

Demographics

A variety of facility types were included in this study. There were three smaller community hospitals ranging in size from 134 to 297 beds, two tertiary care facilities with bed counts of 174 and 500, and one hospital system consisting of three hospitals with a combined capacity of 900 licensed beds. Although each of these facilities was larger than NHB, each facility provided health services that were similar to those provided by NHB: all study facilities provide inpatient, ambulatory, and emergency care services. Four of the facilities also offered primary care and one provided on-site urgent care. Additionally, like NHB, three of the facilities hosted family practice residency programs. Finally, of the six organizations interviewed, three were not-for-profit hospitals and three were government facilities.

Organizational Structure

All six of the facilities had centralized coding/HIM departments for inpatient coding. However, many facilities

deviated from centralization of the coding function for primary care coding.

For primary care coding, providers or clinic staff performed most initial coding with only auditing and oversight provided by coding staff. Supervisors in one facility argued that placing coders in clinics reduces coder productivity because coders are often given clerical tasks that take them away from their coding duties. This finding is in contrast with several articles that suggested that physician documentation and coding accuracy improve dramatically when coders work closely and collaboratively with providers at the point of service (Danzi, Masencup, Brucker, & Dixon, 2000; Stavely, 2000). The finding that providers often perform initial coding of primary care records is consistent with the literature. However, the literature also shows a high level of inconsistency in code selection between coding professionals and providers (Iezzoni, 1997; King, Sharp, Martin, and Lipsky, 2001; Moss & Schexnayder, 2001).

Coding inconsistencies may be even more pronounced for military providers since their pay is not directly affected by coding performance: Military providers are not reimbursed under any type of pay for performance schemes. The more direct link between coding and reimbursement for providers in private practice may explain why military providers at NHB have shown an

interest in code selection training as they prepare for separation from the military.

The reporting structures of the HIM departments in this study were fairly evenly distributed. In two of the facilities, the HIM department reported to the chief information officer (CIO); two reported to the chief of administration/operations (COO); and, one reported to the chief financial officer (CFO). In one facility, outpatient coding reports to the CFO and inpatient coding reports to the chief administrator. This particular method of reporting mirrors the NHB reporting structure for medical coding. Although the literature does not endorse a particular reporting structure for HIM, each may offer advantages and disadvantages depending on whether an organization defines the coding function as an extension of clinical care documentation, a medical records function, or primarily a financial function.

Reporting to the CFO may be particularly attractive if the health care organizations place an emphasis on reimbursement maximization. Additionally, when performing step down analysis to allocate facility expenses, coding staff salaries may be more easily justified by the impact they have on reimbursement. However, coding is also very closely linked to medical records and clinical documentation—two critical functions not typically considered financial in nature. Placing coding under the CFO may

also depend upon the relationship between—and the organizational emphasis placed upon—clinical care, medical documentation and coding, and reimbursement. Another consideration in reporting arrangements where the HIM falls under the CFO relates to the idea that coding may be unduly influenced by financial concerns. Given reimbursement maximization as the credo for an organizational coding function and given an HIM chain of command that places an emphasis on reimbursement, organizations may create strong and powerful incentives for opportunistic reporting of coding data. Clearly, the reporting relationship and organizational incentives should be carefully considered in order to prevent undesirable outcomes.

In facilities that have electronic medical records or where coders code from home or other off-site location, reporting to the CIO may be most appropriate. This arrangement may also bolster compliance with HIPAA regulations regarding privacy of patient information. Professional coders working closely with information technology personnel can also be helpful in making the transition from paper to electronic records. Perhaps the strongest argument against placing HIM under the CIO can be made by facilities where paper-based medical records are still in use. Additionally, as medical records and coding become progressively more electronic, coders may become increasingly

distanced from providers and valuable on-site training and consultation opportunities may be lost.

Medical coding data are used by many areas throughout a health care facility and affect many aspects of a facility's operations. Although coding data can play a vital role in an organization's revenue chain, medical coding data are also critical in evaluating billing and HIPAA privacy compliance, provider profiling, and a host of other operational assessment indicators. Because medical coding data have so many uses, the data must be accurate, unbiased, and suitable for its intended use. Therefore, coders need to remain autonomous in order to work with physicians as educators and consultants and apply codes according to accepted standards and guidelines. Coders must also be able to provide an honest evaluation of the health information management system. Because of the coding function's importance and because of the interconnectivity and interdependence of this function with other organizational entities, a strong case can be made for placing operational control of HIM with the COO. Because the COO has a vested stake in all aspects of a health care organization and represents all disciplines, such an alignment may represent an ideal reporting hierarchy.

Across the civilian organizations studied in this project, the HIM departments were fairly comparable in terms of

organizational design and work processes. All HIM departments included coding, transcription, and medical records as key work functions with all of these functions collocated in a single work space. The only exception to this organizational design is one facility that also included billing as a division of its HIM department.

Much like NHB, the government facilities represented in this study tended to geographically and organizationally separate traditional HIM functions. One facility grouped coding, transcription and inpatient medical records in one division, billing in another division, and outpatient records in another division. These divisions all reported to the patient administration department. Much like NHB, another facility organized coding, transcription, and inpatient records in one division; assigned outpatient records to another division; and, established a reporting chain where both divisions reported to the patient administration department. The outpatient coding section of this facility is located in another area of the facility, collocated with the medical billing section, and reports to the business office.

Many factors may explain the organizational design differences between military and civilian organizations. Corporate culture, traditional organizational structure of MTFs, political processes or other environmental factors suggested by

Shortell and Kaluzny (2000) may have influenced HIM department design. Further explanations may include facility space limitations, organizational adaptation to new or changing requirements, or incremental changes that occurred over a long period of time. Regardless of these plausible explanations, the current organizational design of HIM within the military may deserve a fresh look to determine its relevancy to the current health information management environment.

Staffing

Staffing levels within the HIM departments varied by the size of the facility and the volume of records to be coded. The smallest facility, supporting only 134 beds, had four inpatient coders, one ambulatory procedure coder, and two outpatient contract coders currently assigned to the organization. The largest facility employs 22.6 full time equivalent inpatient coders that code all inpatient stays, ambulatory procedures, and emergency room visits to support its approximately 700 active beds. The largest military facility, which supports a primary care residency program as well as 172 beds and an emergency room, currently employs seven inpatient coders and one emergency room coder. This facility is planning to add 11 new outpatient coders to its staff to help support its transition to line item billing for outpatient visits. Although this facility is much larger than NHB, the facility's plan to hire 11 new outpatient

coders highlights the expected impact that line item billing will have on workload related to the organization's outpatient coding function.

Of the six facilities interviewed, one half relied solely on staff coders. The other facilities employed a mix of staff and contract coders. None of the six facilities interviewed offer off-site or home-based coding to their employees. However, several facilities plan to consider offering home coding in the future in order to overcome coder shortages, regain facility space, and increase employee satisfaction. Two of the most noted obstacles to home coding were HIPPA privacy requirements and technology constraints.

In addition to employing a mix of staff and contract coders, facilities also employed a mix of credentialed and non-credentialed coders. Despite the fact that formal coder education and certification has been available for many years, only one facility in this study was fully staffed with credentialed coders. One other facility required certification of its coding staff within two years of employment. Most facilities, however, employed personnel with varying degrees of credentialing: The typical departmental mix included certified and registered personnel as well as those lacking any form of official coding credentials. Personnel who lacked credentials acquired their coding skills through on-the-job training. This

finding is consistent with a survey conducted by Dunn and Mainord (2001) that found over 30% of practicing coders are non-credentialed.

Although most organizations preferred that coders have some experience in medical coding, most of the organizations did not require experience. Only one facility required coder certification as a prerequisite of employment. Government facilities maintained the least restrictive requirements: No formal coding education or experience is required. Because the coding positions at government facilities are normally general schedule (GS) positions, the Office of Personnel Management places restrictions on what can be included as prerequisites for these positions. One interviewee suggested structuring applicant interview questions to allow for skill assessment. For example, asking job applicants to describe the last time they coded a medical record and to discuss the specific steps they used to arrive at the appropriate code selection may be one way of assessing a potential employee's knowledge and skill levels that relate to coding processes. Another way to ensure that prospective coder's possess certain skills or abilities is to fill coding positions with contract coders. In developing the terms and conditions of a contract, facilities can include language that specifies job-related requirements and prerequisites for personnel assigned coding duties. However,

contracting out for coding services can be a costly alternative to the use of staff coders.

The work schedules of coders at most of the facilities followed the typical 40-hour Monday to Friday workweek. However, many of the facilities also offer flexible scheduling arrangements that include weekends, 10-hour shifts with abbreviated weeks, or staggered shifts. Dunn and Mainord (2001) found that offering flexible schedules to coders might also help with coder job retention and reduce the space requirements for coding staff by having coders on different shifts share the same workspaces.

Four of the six facilities in this study indicated that coders coded all types of health records, which included inpatient, ambulatory, emergency room, and, if applicable, primary care records. The other two facilities had separate coding staffs based on record type. One of these facilities had an inpatient coding section, which performed only inpatient and ambulatory care coding, and in-house contract coders for emergency room and outpatient coding. The other facility outsourced its primary care and emergency room coding to an out of state vendor.

Coder Responsibilities

Only one of the facilities in this study had clearly written productivity standards for its coding staff. The

facility required each coder to code 36 inpatient records and 420 outpatient records, on average, per week. Some of the HIM departments had policies on timeliness of coding. Several facilities, for example, required the HIM department to code all records within three days of receipt. Despite the lack of formalized performance objectives, most of the interviewees had a good idea of how many records their coders were, or should be, able to proficiently code, on average, per day. The number of inpatient records that each coder was able to code ranged from 8 records per day at one facility to 26 records per day at another facility. Five of the six facilities reported that each of their coders could code, on average, greater than 20 inpatient records per day. For same day surgery or ambulatory procedures, facilities reported that coders could code in the range of 8 to 43 records per day with most facilities reporting that each coder could code between 30 to 35 records per day. For emergency room and primary care records, facilities reported that each coder could code between 100 and 120 per day. The figures reported above are fairly consistent with the productivity measures presented in Table 1.

At the lower bounds of coder productivity, one HIM supervisor reported that assigned inpatient coders coded only eight records per day for inpatient and same day surgery records combined. Although this low number of records coded per day may

appear as an outlier, it has particular relevance to this case study for two reasons. First, this was a military treatment facility closely resembling size and scope of services offered at NHB. Second, the coding productivity level for inpatient and same day surgery records approximated, and were actually slightly higher, than those of NHB.

According to a survey conducted by Dunn and Mainord (2001), differences in coder productivity are greatly impacted by coder responsibilities and record conditions. Record conditions may have an even greater impact on inpatient and same day surgery record coding because these records require a more in-depth record review prior to coding. Before code assignment begins, coders are responsible for a review process, which includes abstracting, appropriately assembling the medical records, and, ensuring correct sequencing of patient diagnoses. Coders in all the facilities in this study performed sequencing and assignment of ICD-9-CM, CPT-4, and other relevant codes. However, record abstracting was a coder responsibility in only four of the facilities and record assembly/preparation in only two facilities. The remaining facilities had clerical or ward personnel complete these functions prior to records reaching the coding staff. At NHB and at one other facility with low inpatient/ambulatory coder productivity levels, both abstracting and record assembly are performed solely by coding personnel.

Additional job requirements placed on coders assigned to these facilities may at least partially explain why the coders have not met the coding productivity levels of coders at other facilities.

Other areas that may impact coder productivity include record conditions, coding resource availability, and the type of grouper and encoder systems employed by an organization. According to a study by Dunn and Mainord (2001), only about 55% of coders work with assembled and orderly records and more than 60% must code from incomplete records. Although most of the facilities in this study reported favorable record conditions, the lack of objective comparative criteria in the interview instrument made it difficult to assess the impact of medical record condition on coder productivity.

Although all six facilities reported having access to adequate coding resources, all differed in the type of resources accessible to coders. Some facilities relied upon encoder software to answer coding questions while others relied on hardcopy or online resources. The use of encoder/grouper systems varied considerably between the six facilities interviewed. Two of the facilities used a 3M Health Information Software system; one employed a QuadraMed system; one employed a MEDICUS system; and, one employed a Cascade system. The military facilities use a system developed by American Management Solutions. Although

there was no consensus among the facilities as to which system was the best, study facilities considered the 3M system to be the most user friendly and intuitive system, especially for less experienced coders.

Super-bills and physician templates were frequently used by facilities that offered primary care. These tools, which generally consist of a single page listing of commonly used diagnosis and procedure codes, aid both physicians and coders by affording a concise fill-in-the-blank abstract of each patient encounter. However, interviewees stressed that these tools are only useful if they are kept current and free of discrepancies. Although useful, super-bills are not a substitute for the medical record documentation. Codes must be consistent with and supported by medical record documentation. In many of the facilities interviewed, providers perform their own initial primary care coding. Coders or other clinic staff then verify the codes and enter coding data into the coding system. A weakness in this system is that medical records are often not available to coders or clinic staff at the time of code verification and data input. Due to the volume of outpatient care visits at NHB and the reliance on only one trained outpatient coder, the practice of entering codes in the absence of the actual medical record is standard practice.

Training

Health care providers and HIM staff are the primary audiences for training that focuses on medical coding and medical documentation procedures. To a lesser extent, clinical support staff, billing staff and other personnel that use coding information are also included in training sessions.

While training plans varied among facilities, the training of coders, whether individual or group-based, is initially intensive for new coding staff, but training intensity tapers off as new coders become comfortable with the facility's coding policies and procedures. Focused sustainment training usually follows initial training and is conducted as needed. Trainers usually focus on skills maintenance in medical documentation; CPT, ICD-9 and E/M coding; and, coding changes and updates promulgated by CMS. Most of the facilities rely on record reviews and deficiencies noted during audits to drive training topics.

Training methods ranged from in-house classroom training and local college courses to AHIMA audio seminars and online training courses such as coding clinic and CPT assistant. The frequency and duration of training sessions also varied widely between facilities. Although facilities reported that training in coding and documentation was important, most facilities did not have an established and recurring training program designed

to cover these critical functions: training sessions were infrequent and developed only as needed. One of the military facilities seemed to have a particularly robust training program. Coders in this particular facility participated in biweekly in-service training sessions and attended a monthly video teleconference (VTC) with other HIM departments to discuss current HIM issues.

While most facilities in this study had reasonably clear training plans for coding staff, the coding and documentation training programs for health care providers was much less structured. This was a surprising finding given the literature's strong and consistent support for such programs. Provider training was particularly sporadic in civilian facilities. This may be explained at least partially by differences in provider affiliation between civilian and military facilities. In many civilian facilities, providers may only have admitting privileges or partnership status, whereas military facilities employ mainly active duty staff providers with the privileges that accompany staff employment. Because of this staff relationship, military management may have greater control than civilian management in establishing and directing training requirements for assigned health care providers. Civilian facilities may, however, have more flexibility than military facilities to suspend a provider's admitting privileges for

substandard health record documentation or for failure to follow facility policies.

The training plan at NHB compares favorably to most of the facilities in this study, particularly for primary care provider training. However, having only one outpatient coder to train NHB's entire provider staff while simultaneously coding records, performing audits, updating provider templates and overseeing the outpatient-coding program, can be overwhelming and can reduce the coder's ability to effectively execute all functions.

Given the high value placed upon work time, the frequency, method and focus of training must be carefully considered and weighed against facility requirements placed upon health care providers and coding personnel needs. Other planning considerations include a facility's decision to pay for off-site training or continuing education units (CEUs) for coding staff to maintain their credentials. Of the six facilities interviewed, more than one half paid for at least some CEUs and most paid for audio seminars and training courses with coding content. However, none of the facilities had specific criteria for measuring the impact of training on coding accuracy. Without evaluative criteria, organizations cannot determine if the training costs are worth the potential benefits gained from training.

Auditing

Facilities used a variety of auditing techniques. These auditing techniques varied in terms of focus, process and sampling methods. Three of the facilities randomly select 25-30 of each coder's records, annually, to measure coder proficiency. Analysis of the results is used in two ways: Supervisors use the results to evaluate coder performance and to identify individual and departmental training needs. Another facility uses a similar method but randomly selects 10 inpatient records per coder per month plus 3 to 5% of each coder's outpatient records to assess coding accuracy. The military facilities generally follow service requirements of randomly selecting 15 inpatient and 15 outpatient records per month to assess coding accuracy. Military facilities then forward audit results to higher headquarters where the results are consolidated and compared with the input provided by other MTFs.

In addition to assessing coder proficiency, other auditing techniques were aimed at specific record types. To ensure proper codes are assigned before a bill is sent, one military facility audits all records where there is an identified third party payer. Another facility audits all records for new services or procedures as well as all records of new coding staff until proficiency is established and new coders are comfortable with coding. Other facilities employ a reactive auditing approach by

focusing on rejected claims to identify and correct errors and other coding deficiencies.

Only one of the facilities uses an external auditor, once every other year, to conduct facility-wide coding audits. Other facilities, primarily civilian, receive random external coding reviews under contractual agreements with third party payers, such as managed care organizations (MCO).

Although the literature implies a more widespread use of auditing software, none of the facilities in this study employed such a system. Some facilities had automatic or concurrent code editing programs built into their encoder systems to catch errors or alert coders to possible coding problems. One facility also uses a program (MEDSTAT) to compare and analyze coding trends with other facilities.

Nearly all facilities shared a common limitation with their auditing programs: Facilities employed auditing efforts that were generally uncoordinated and were often aimed at only specific areas of coding while other areas were not audited. Reviewing individual coder records does not necessarily measure facility level coding accuracy nor identify facility-wide trends or deficiencies. Reviewing only claims rejections may fail to identify individual coder or provider coding deficiencies.

Although external auditors may be able to provide a one-time snapshot of coding performance and provide consultation to

correct deficiencies, infrequent assessments may fail to adequately address the impact of training or other program changes. Capturing more detailed information during facility-wide record audits may be a more viable method. This information could include identification of the specific provider who documented the patient encounter; identification of the coder who coded the record; specification of the clinic or ward where care was provided; and, other encounter-specific information. Capturing this information can help identify training needs for both coders and providers; can identify coding trends of an individual clinic or ward; and, can also be used to assess facility-wide coding trends. Organizations may still want to conduct targeted audits for several reasons. These audits may result from the need to assess the coding proficiency of new staff, high error or new procedures, or areas identified by OIG audits as high risk for coding errors. However, because audits are expensive and time consuming, each audit should assess as many areas of a coding program's effectiveness as possible.

Data Quality

The interview questions referring to general health information data quality issues were perhaps the most insightful. The responses clearly indicated the key constraints affecting coding accuracy. Every individual interviewed identified provider documentation as the number one factor

affecting the quality of coding data. The primary documentation weaknesses identified by interviewees were the illegibility of provider medical record entries and insufficient medical record documentation.

Most interviewees also suggested that additional provider training and increased provider involvement in meeting documentation requirements would improve the process and quality outcomes associated with the documentation process. The literature clearly identifies the need for more training and collaboration between coders and providers and this need is consistently identified throughout this study as a key constraint to coding accuracy.

When questioned about what changes to current HIM programs would most benefit data quality, only two interviewees responded. One suggested hiring a sufficient number of coders so that a trained coder can review and code every record for every visit. While this may be an ideal situation, fiscal constraints could make this change prohibitive for most organizations. The other interviewee suggested that establishing a system of accountability for providers to increase their ownership of the coding process would improve data quality. This suggestion may be feasible, but it would require leadership involvement from providers and management to reach a viable agreement.

The final interview question involved the future of HIM: Interviewees were asked about the direction and nature of expected changes in the field. Interviewees overwhelming responded that the future direction of HIM would include increased automation of coding and an increase in home or off-site coding. One respondent felt that the role of coders would change as automated systems, capable of automatically assigning codes from electronic patient records, become available. The new role of the coder then would be one of data quality analyst or a gatekeeper and auditor of health information. This respondent also suggested that HIM professionals would become more active in utilization management and peer review functions related to health information and patient care.

Recommendations

Data quality depends largely on the components of completeness, timeliness, and accuracy. A review of the literature along with pertinent findings from the field research indicate several elements of an HIM program that can directly impact these components and improve the quality of medical coding data.

First, a program should have a sufficient foundation of coding expertise available to perform coding functions as well as to provide ongoing coding education when and where needed. Second, organizations should have a strong proactive training

program in coding and documentation that focuses on all of the key personnel involved in the coding process. Third, an HIM program should have an auditing system capable of uncovering coding deficiencies, identifying training needs of coders and providers, as well as measuring coding accuracy and the impact of system changes at the facility, clinic, and individual level. Last, a strong HIM program should have an organizational structure that is conducive to achieving data quality and flexible enough to support the above objectives, while fitting into the corporate culture and current organizational design.

The challenge of this research study is to design a coding program that meets these needs while efficiently using resources and keeping mindful of NHB's strategic plans and objectives. The recommendations will begin with the organizational design and positioning of NHB's coding function. This will be followed by recommendations related to staffing, training and auditing of NHB's coding function. A summary of the proposed recommendations compared to the status quo is included in the cost benefit analysis contained in Appendix D.

Organizational Structure

1. Consolidate inpatient and outpatient coding sections and combine with transcription and medical records, both inpatient and outpatient, to form a single health information management division. This new division should be located within the

workspaces where NHB's outpatient medical records currently reside. Organizing HIM as a division, as opposed to a department, reflects the command's desire to prevent the addition of new departments to its hierarchy.

This re-organization and consolidation takes an input-process-output approach to improving the data quality of health information data. Input includes all documentation of the patient-provider encounter. Output includes billing, utilization review, quality assurance, population health, and other uses of health information data. Making this organizational change will bring all the input processes together, which will result in the formation of a single functional area. The proposed change will bring coders closer to medical records, making the records more accessible to coders when performing coding and conducting record audits. The proposed organizational structure also facilitates cross training and provides greater flexibility in the use of HIM personnel assets to accommodate fluctuations in workload. Additionally, this will bring NHB in closer alignment with the HIM functions of the civilian community.

The major obstacle to making this change may be the availability of space to accommodate additional personnel in the medical records section of NHB. The facility has recently completed a 55,000 square foot addition to the main hospital building. Outpatient medical records are currently located on

the first floor of the addition. As part of the facility's ongoing renovation project, inpatient records have been collocated with outpatient medical records. Another planned change is to move staff health records to a new location in the facility. Once this occurs, it will free up additional space in the medical records area and may help accommodate the addition of coding and transcription staff.

2. Decentralize outpatient coders by placing them in clinics.

By placing outpatient coders in clinics, they will be able to work more closely and collaboratively with providers on coding issues. Coders will also be able to provide timely on-site training to providers and be able to quickly rectify coding or documentation deficiencies. Additionally, by placing coders in clinics, the time between patient encounter and coding may be decreased. This increases the chance of providers remembering the details of a particular visit. An added benefit to decentralizing coders is that it will reduce the space requirements of the HIM function within medical records.

Although decentralizing inpatient coding by placing coders on wards is feasible, decentralization was not well supported by either the literature or the case study interviews. The main arguments against placing coders on wards to perform concurrent coding were duplication of work and limited accessibility to non-staff providers. However, because most admitting providers

at MTFs are staff, they may be more accessible. Also, having coders on wards may allow for closer collaboration between coders and providers as well as ward staff and can facilitate training efforts regarding coding, record assembly, and documentation needs.

3. Place the HIM function within the patient administration department under the operational control of the director for administration/operations (DFA/O).

This only requires a slight modification to the current reporting structure since inpatient coding, transcription, and medical records already come under the patient administration department. The primary changes will be the transfer of outpatient coding from the business office to the patient administration department and consolidation of HIM components under one functional area.

Another consideration that led to this recommendation is the current reporting structure of NHB's management information department (MID), which reports to the DFA/O. One of the goals of NHB's strategic plan calls for the eventual transition from paper to electronic records. When this occurs, the HIM function will become increasingly linked to MID. Having a close organizational relationship between MID and HIM during the transition from paper to electronic records will also be

beneficial. Once the transition is complete, the command may want to consider restructuring HIM under MID.

The recommendation to move outpatient coding from the business office to the patient administration department may be the most controversial. The outpatient coding function has made great progress in improving provider coding and documentation through its proactive training program. These improvements have also contributed to increased third party collections. However, the improvements of NHB's outpatient coding should not be hindered by an organizational realignment. Because only one outpatient coder is currently assigned, the change should cause minimal impact on business office operations. Outpatient coding should continue to work closely with the business office and billing personnel as well as with other "output" users of coding data.

Interviewees and the NHB coding staff recommended against having NHB coding personnel report to clinic or ward management. Several reasons were given to support this recommendation. First, coding personnel must remain autonomous in their judgment regarding code assignments. Second, if coding personnel belong to clinics, they may be assigned clerical or non-coder related duties that will decrease their productivity. Additionally, if clinics view coding personnel as clinic staff, a clinic's

supervisor may be reluctant to reassign them even though the coders could be better utilized elsewhere in the facility.

Staffing

1. Add five to six additional outpatient coders either through new hires or contract personnel.

A key constraint to improving the quality of medical coding data at NHB is the insufficient number of qualified outpatient coders. Ideally, there would be enough coders to code every outpatient visit. To meet this ideal staffing level would require between 12 to 15 coders to code the 285,000 outpatient visits seen by NHB annually. This assumes that each coder codes between 20 to 24 thousand records per year or about 90 to 110 records per day 220 days per year. The 220 days per year figure takes into account weekends, holidays, annual and sick leave, and training. Other factors that may affect productivity include coder time spent training providers and attending training sessions for themselves, and the change to line item billing, a change that will require more detailed coding of services.

The recommendation to hire staff coders versus contracting for additional outpatient coders is beyond the scope of this study. Each method has advantages and disadvantages. Hiring additional GS staff is much less expensive and may allow greater control and continuity of coders. However, as evidenced by NHB's difficulty in finding even one outpatient coder to fill its

current vacancy, filling five or six positions may prove to be unfeasible. The problem could be due to a tight local labor market for coders, differences in compensation between civilian and GS coders, or both. Some alternatives may be to enter into a placement agreement with a local college or coder training program or offering incentives such as course reimbursement in exchange for employment assurance. A major disadvantage of either of these options is that they are mainly long-term solutions.

With the short timeline for implementation of line item billing, contracting coders may be a more viable option. The biggest obstacle is cost. The command had previously considered contracting coders but found the cost prohibitive. However, if vacancies continue to exist when line item billing is implemented, the impact on third party collections, which now exceed one million dollars annually, may justify the increased cost. Since line item billing for outpatient services will be implemented throughout the military, a blanket navy-wide contract for coders may also be a way of negotiating more reasonable terms. An obvious advantage of contracting coders is the quick access to qualified coding personnel. Other advantages include more flexibility in defining requirements and other coder qualification criteria. Additionally, contracting coders

may allow more flexibility in accommodating changes in workload or technology that affect coder requirements.

Another option may be to contract for coders for a limited term, say a year, to initiate a strong coding program and establish a baseline period for assessing the impact of line item billing. During this time period, other longer-term, less expensive solutions can be considered.

2. Convert three of NHB's inpatient coders to outpatient coders.

Relative to the productivity standards outlined in the literature, NHB is currently overstaffed with inpatient coders. The current inpatient workload of approximately 3,000 admissions and 1,800 ambulatory procedures per year conservatively supports a requirement for only two inpatient coders. NHB has five inpatient coders in addition to a supervisor that oversees inpatient coding, transcription services, and inpatient records archives.

Making this change will require re-training of inpatient coders. Their familiarity with medical terminology and diagnosis and procedures coding systems should help make this transition easier. Additionally, NHB's outpatient coder/trainer currently teaches outpatient coding at a local community college and believes that re-training the inpatient coders will not be excessively difficult. Having coding staff trained in both

inpatient and outpatient coding will also be advantageous during the transition to a smaller inpatient coding staff.

3. Add additional clerical staff to inpatient coding to take over some non-coding tasks such as initial record abstracting and record assembly and preparation for coding.

Using coders to perform these tasks is inefficient. Nearly every facility interviewed for this study used less costly clerical personnel to perform these functions. This realignment of duties will not necessarily require hiring additional staff. With some training, ward staff, medical records staff, or possibly other intra-organizational assets may be able to absorb these tasks.

4. Redefine coding staff responsibilities to accommodate new organizational design and staffing changes.

Because there will be an insufficient number of outpatient coders to code every record, a key responsibility of coders should be to train and assist providers in coding. Providers should perform initial coding. By decentralizing coders, they will be assigned to clinics based on workload and identified needs. Coders will verify accuracy of code assignments on super-bills per current guidelines and input codes into ADS. They will also ensure super-bills are current and free of discrepancies, and provide on-site training to providers.

The outpatient coding supervisor will be responsible for auditing outpatient records, evaluating coding accuracy and maintaining coding staff proficiency. The supervisor will also target training needs of coding staff and providers, develop and provide formal training for coding staff and providers, and ensure coding updates are disseminated to coding staff and incorporated into super-bills. Another important responsibility of the outpatient coding supervisor will be to determine the most appropriate placement of coding staff within the various clinics. This will include determining when, where, how many and how long coders should be placed in a clinic based on audits, workload, and specific clinic needs.

For inpatient records, clerical staff should assemble records, perform initial abstracting and prepare records for coding by inpatient coding staff. Inpatient coding staff will then code records per current guidelines and timeliness standards.

The inpatient coding supervisor would be responsible for conducting audits of inpatient records to evaluate proficiency of coding staff and target training needs. Additionally, the inpatient coding supervisor would develop targeted training plans focusing on areas for improvement in coding accuracy. The supervisor may also perform coding of records with identified third party payers as well as other records as needed.

Both the inpatient and outpatient coding supervisors should also be active members of the medical records and quality assurance committees and work with the MID, clinical staff, the billing department, and other stakeholders involved in the medical coding process. The proposed HIM organizational and reporting structure is shown in Figure 1.

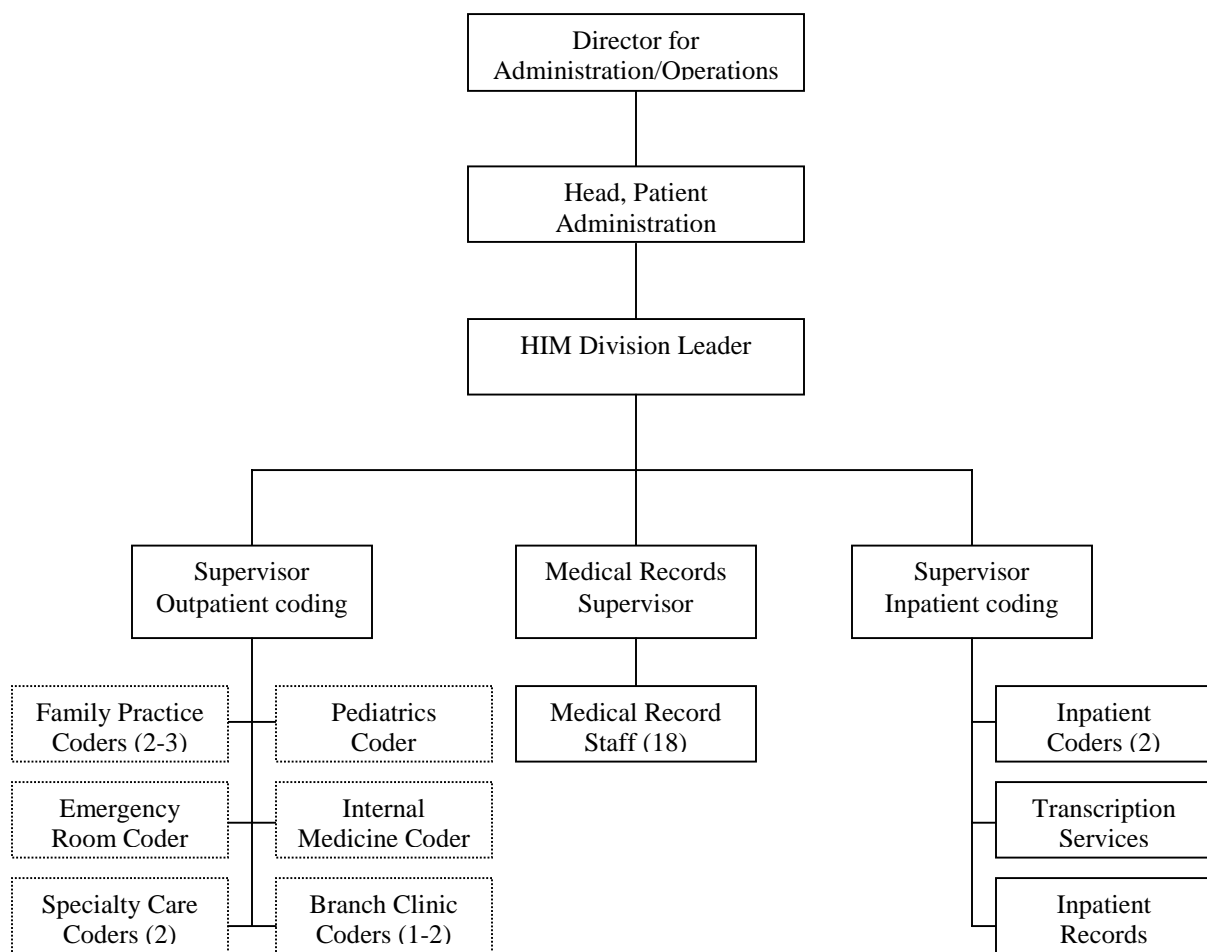


Figure 1. Proposed health information management organizational and reporting structure.

The dashed lines in Figure 1 indicate proposed placement of outpatient coders. This placement will vary to accommodate

departmental needs and fluctuations in clinic workload. The three section supervisors will report directly to the HIM division leader. Having a single oversight position for the three sections will streamline coordination between the sections. This reporting structure may foster closer working relationships and collaboration of efforts among the three interrelated sections ultimately improving coding and medical record documentation.

Training

One of the greatest strengths of NHB's coding function is its vigorous training program, particularly its outpatient provider training. This training should continue. However, the addition of new outpatient coding staff will require development of training plans to address unique training needs of newly assigned personnel. Another area that could be improved upon is leadership, particularly provider leadership, to support the training effort.

1. Develop training plans specifically designed to address inpatient coding and documentation requirements.

Military treatment facilities have an advantage over most civilian hospitals because physicians that admit patients in MTFs are generally hospital staff. Because of this staff relationship, organizations have a captive audience for training and other organizational requirements. One of the coders

interviewed for this study commented on the noticeable improvement in documentation and record conditions by hospitalists, physicians that specialize in inpatient hospital care, compared to that of non-staff physicians. Insufficient physician training on inpatient coding and documentation may also contribute to increased workload for inpatient coders who have to sift through, organize and translate records before coding can even begin. Training ward personnel on record keeping, documentation, and coding requirements may also help alleviate unnecessary duplication of effort by coders. Increased emphases on training for ward personnel may also help increase the productivity of inpatient coders as the number of inpatient coders is reduced.

2. Increase leadership involvement in emphasizing the importance of improving the quality of medical documentation and coding.

The key to improving the quality of documentation and medical coding data rests with the provider staff. Getting providers involved in learning how to properly document patient care encounters and accurately code them will go a long way in helping them understand their patient population and improving patient care.

Establishing a coding hotline or coding assistance e-mail account, specifically designed to help providers with coding questions, may also be a valuable tool to give providers the

training when they most need it. A similar e-mail system was employed at one of the facilities interviewed for this study. According to the interviewee, the system was frequently used by providers and, according to provider feedback, provided them invaluable assistance in coding and documentation.

Because providers' time is scarce and valuable, organizations must balance coding and documentation training with other important and competing demands. Further, because providers are aware of the scarce and valuable nature of work time, providers must "buy-in" to events or programs that reduce time spent focusing on patient care. Soliciting provider input on training topics and development of training plans may help ensure that training sessions are worthwhile. However, emphasizing the importance of training and getting providers to attend training sessions when needs are identified is incumbent upon leadership. The training will end when the training is no longer needed.

Auditing

1. Increase the sample size for record audits and reduce audit frequency.

The current practice of randomly selecting 15 inpatient and outpatient records each month for coding audits is insufficient for measuring facility level coding accuracy. To guarantee results with a 95% level of confidence would require a sample

size of 385 records. Additionally, selecting the 15 sample records from only a single clinic each month for outpatient audits further reduces precision of the sample for measuring facility level coding accuracy and may skew navy-wide audit results when NHB results are aggregated with the results of other Navy MTF's. Since this audit requirement comes from BUMED, it must continue to be met. However, future outpatient record samples should be selected from among all outpatient visits during the month, instead of from a single clinic, to provide a more accurate measure of facility coding accuracy.

Increasing the outpatient record sample size to 385 records would increase the validity of the sample and obtain results within +/- 5% of the true error rate with a 95% level of confidence. Once an estimation of the percentage of records with coding errors is obtained from the initial audit, future audit samples may be reduced.³ Likewise, the sample size for inpatient records audits should also be increased. However, because historical audits have consistently shown errors in only approximately 10% of inpatient records, an appropriate sample size may be closer to 140 records.

³The new sample size can be determined using the sample size formula $n = \pi(100-\pi)/(\sigma_p)^2$ where n = sample size, π = percentage of records with errors, and $(\sigma_p) = 2.55$ reflecting an error rate within +/- 5% of the true value at a 95% level of confidence. For example if the error rate is 20% then $n = 20(100-20)/(2.55)^2$ or 247 records (Sanders, 1995).

Although audits can be an effective way of measuring coding accuracy, they can also be time consuming and take time away from training and other coder duties. Therefore, it is recommended that NHB conduct facility audits on a quarterly basis instead of monthly. The proposed change would allow time for training interventions to take effect and would allow for a more meaningful assessment of the impact of these interventions. Another alternative may be to continue with monthly audits but increase the sample size to 100 outpatient records and 35 inpatient records. If the samples are randomly selected from each month's visits and discharges, the aggregate quarterly results should not be significantly different from conducting a single quarterly audit. However, seasonal or cyclical variations that impact workload or otherwise affect coding processes or outcomes must be accounted for when aggregating audit results. Audits may eventually be scaled back to semi-annually or even annually as coding accuracy reaches a level that is acceptable to NHB management.

2. Capture more detailed information when conducting record audits to maximize the use of audit results.

Capturing as much information as possible about coding errors during record audits can produce useful information beyond facility level coding accuracy. Useful data may include visit-specific information such as the name of the provider who

treated the patient, the clinic the patient was seen in, the coder who coded the record, and the type of visit or procedure. Other information should include the types of errors identified (e.g., clerical, judgmental, or documentation deficiencies), as well as any trends or systemic coding errors. This information can then be used to identify training needs for coders, providers, or clinics; and, can indicate the need for other interventions, such as personnel realignment among clinics.

Evaluation of Recommendations

Because medical coding has a direct impact on reimbursement, the argument is persuasive that coding is a financial function. In fact, many health care organizations use the positive relationship between the number of coders and reimbursement revenues as justification for hiring personnel with coding skills. This may help explain why coders often report to a facility's CFO. It may also contribute to the high demand and increasing salaries paid for knowledgeable and skilled coders. The research conducted for this study, however, indicates that coding is much more a function of accurately describing and accounting for workload and level of effort involved in the delivery of health care services. This perspective may provide a more meaningful basis for evaluating recommendations, particularly in a military health care setting.

The vast majority of health care funding for the MHS is funneled down from the DoD line authority where departments compete over scarce dollars for ships, aircraft, weapons systems and other defense-related items including the Defense Health Plan (DHP). From the DHP, funding is provided to the TRICARE Management Activity where it goes through a bid price adjustment process to forecast the cost of funding TRICARE contracts based upon the previous year's demand for services. When more health care services are captured by MTFs, the bid price is adjusted in favor of the services. Likewise, when more health care services shift out into the TRICARE network, the bid price is adjusted in favor of the TRICARE contractors. Once the bid price is determined and funds are set aside to pay TRICARE contractors, the remaining funds are allocated among the services and finally made available to individual MTFs. The amount each MTF is allocated is based to a large extent upon its previous year's funding. Because of the way the funding is set up, there is an incentive to capture as much care as possible within the MTFs. However, because bid price adjustments are made at the service level, they do not necessarily reflect the level of effort or workload of an individual MTF. Therefore, if a very efficient facility is successful in capturing additional workload, all facilities share in the gains, including the less efficient MTFs.

When line item billing for health care services begins, MTFs will have to show not only that a patient visit occurred but also a detailed description of the services rendered. The description will include the diagnosis, level of intensity for the visit and each test, procedure, and prescription used in the delivery of care. In other words, they will have to accurately account for costs and level of effort, something that up to this point, the MHS has not done very well. Line item billing provides the DoD with a measure of accountability: The system helps justify and account for dollars spent on the DHP.

Reaching this level of accountability will require accurate documentation and coding of each patient encounter. Until now, the accuracy of medical coding, at least from a financial perspective, has not really mattered within the military unless a third party payer was identified. If a patient comes in with uncontrolled diabetes and circulatory problems requiring an extensive work-up and multiple tests-but the record is erroneously coded as a routine diabetic check-up-there is no financial impact on the facility unless the facility can charge a third party payer for services. This type of scenario is not uncommon within the military.

Overcoming coding and documentation deficiencies will require a concerted effort by leadership and provider staff to raise the level of importance placed on the accuracy of medical

coding and documentation. Eliminating coding deficiencies will also require a strong HIM program and an investment in an adequate number of professional coders to help train and assist providers in improving their documentation and coding skills. The recommendations of this study offer a basis for meeting these requirements.

Appendix D provides a decision matrix used to evaluate the impact of implementing the proposed recommendations compared to the status quo. Each of the proposed recommendations was evaluated and subjectively scored against the status quo based on two criteria - organizational impact (OI) and coding quality impact (CQI) - to form a basis for decision-making. The OI scores are negative and reflect the estimated qualitative cost/impact of change that would result from implementation of recommendations. The CQI scores are positive and reflect estimated improvements in the quality of medical coding data that would result from implementation of recommendations. Scores are based on the level of impact and the estimated timeframe that the impact is expected to last or occur.⁴ A net impact (NI) score is also given for each recommendation. A positive NI score

⁴Ideally, this project would have included a cost benefit analysis with all costs and benefits of proposed recommendations expressed in dollars so that a direct comparison could be made regarding the allocative efficiency of resources (Aday, Begley, Lairson, Slater, 1998). However, due to the time and resource constraints placed on this project, criterion evaluation was limited to qualitative scoring. This limitation may increase the subjectivity of the study and should be considered when judging study recommendations.

supports the recommended action; a negative NI score supports the status quo. Eight of the ten recommendations resulted in a positive NI score, supporting the decision to implement the proposed recommendations. Although it would be feasible to implement some recommendations and forego others, the interdependence between recommendations suggests an optimal solution of inclusive adoption of all recommendations.

Investing in a better system of accountability for services may not completely pay for itself in strict financial terms. However, if adopting the proposed recommendations results in NHB gaining a better understanding of the health care needs of its patient population by improving the quality of data used to support decisions, then implementing these recommendations may be a prudent decision.

Conclusions

The pervasive problem of the MHS to accurately budget and account for its health care funding is well documented. Improving accountability through better documentation and accurate medical coding is a positive first step.

Making these improvements means gathering accurate health information on the MHS beneficiary population and fully documenting health care encounters. This information then needs to be transformed into useful data that can be used to track health care trends and make decisions on how to best align

health system resources to support the population's health and health care needs. A rich source of information to support these decisions is medical coding data. To be useful, this data must be accurate.

In the future, the health care industry will most likely continue to seek and adopt advances in technology to streamline patient care delivery, reduce administrative costs, and meet the health care needs of an increasingly mobile patient population. Technological changes will include increased use of electronic medical records and encoding software that can automatically code records. These systems certainly have great potential to improve the efficiency with which health care is delivered. However, operating these systems require human input and interaction.

As these systems come on line, the roles of HIM personnel will undoubtedly change. HIM personnel, including coders, will be relied upon to help make the transition to electronic records and provide training in the use of coding software. Once the transition is made, their roles will most likely evolve into oversight and quality assurance functions related to health information. Investing in professional coding staff can help improve the quality of medical coding for today's needs and will continue to pay dividends well into the future.

Hopefully, this study provides a useful tool for NHB's executive staff when considering changes to its medical coding function. While the recommendations in this study are by no means exhaustive, these recommendations will ideally form the basis for discussion and perhaps serve as a model for other military treatment facilities as they struggle with similar issues of workload accountability and coding inaccuracies.

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Appendix A.

Coding Function Interview Form

Facility:		Phone Number:			
Person(s) interviewed:		Position:			
1. Demographic Information		Notes			
1a. Facility Type:					
1b. Organization Type:					
1c. Bed Count:					
1d. Type of care provided:					
2. Coding Organization Structure					
2a. Centralized/ Decentralized:					
2b. Are inpatient and outpatient Coders co- located? Yes/No					
2c. Reporting department/ directorate:					
2d. Other Functions with HIM Dept.					
3. Staffing					
3a. No. of Coders: (FTEs)					
3b. Are Coders staff or contract?					
3c. Do any Coders code from home?					
3d. Are coders certified/ registered?					
3e. Pre-employment requirements:					
3f. Schedules:					
3g. Do Coders code all record types?					
4. Coder Responsibilities					
4a. Productivity/ proficiency Standards:					
How many Rec./Day on average?		OPT:	InPT:	AP-SDS:	ER:
4b. Do Coder responsibilities include:					
Abstracting? Yes/No					
Record assembly? Yes/No					

ICD-9 w/CPT & HCPCS?	
Yes/No	
4c. Are Coding resources readily available to coders?	
4d. What grouper/encoder system is used?	
4e. Do providers perform initial coding? Are super bills used?	
4f. Record conditions:	
4g. Are records electronic? Yes/No	
5. Training	
5a. Frequency and Duration:	
5b. Methods used:	
5c. Focus areas/Topics:	
5d. Are non-coding staff included in training sessions?	
5e. Is separate training conducted for providers?	
5f. How is staff notified of code updates?	
5g. Does the facility pay for required for certification maintenance or CEUs?	
6. Auditing	
6a. What Type of coding audits does the facility conduct?	
6b. Frequency:	
6c. Is auditing software used? Yes/No	
6d. Are external auditors used? Yes/No	
6e. What other metrics are used to assess coding accuracy?	
7. General Questions on Data Quality	
7a. What factors do you believe most affect the quality of coding data?	

Appendix B.

Coding Interview Question Guidance

1. Demographic Information:

- 1a. Is this a Hospital, Primary Care Clinic, Group Practice, etc?
- 1b. Is this facility For Profit, Not-for Profit, Government, etc.?
- 1c. How many patient beds does the facility support?
- 1d. What type of care does the facility provide i.e. inpatient, outpatient/same day surgery, primary care, specialty care, emergency care etc.?

2. Coding Organizational Structure:

- 2a. Do Coders work out of the same area or are they assigned to clinics, wards, off-site, etc?
- 2b. Do inpatient and outpatient coders work out of the same area?
- 2c. What department are coding staff assigned to? What directorate does this department belong to? Is this an administrative, clinical, or financial directorate?
- 2d. What other functions make up the HIM department i.e. medical records, transcription, billing etc?

3. Staffing:

- 3a. How many full-time equivalent coders does the facility employ?
- 3b. Are Coders employees of the facility or contracted?
- 3c. Do some or all staff Coders work from home or alternate work-site?
- 3d. Are coders certified or registered? Is this a requirement?
- 3e. Does the facility require a certain level of pre-employment experience or certification for Coders? Do they require any type of pre-employment competency assessment for Coders?
- 3f. What are Coders work schedules? Do these schedules include evenings or weekends?
- 3g. Do Coders code all record types or do some coders code only inpatient or outpatient records?

4. Coder Responsibilities:

- 4a. Does the facility have productivity/proficiency standards for its Coders? If so, how many records are required per coder per day on average for each type of record? What level of proficiency is required?

- 4b. What tasks are Coders responsible for? Do other employees complete some of these tasks such as medical record technicians doing record abstracting?
- 4c. Are coding resources readily available to coders? Are they kept current?
- 4d. What type of grouper system is used by the facility? Are all resources added to the software?
- 4e. What role do providers play in coding medical records? Do Coders work collaboratively with providers to ensure proper code assignment? Are super-bills are used, does coding staff maintain them to ensure they are up to date?
- 4f. What condition are medical records in when they are received by Coders? Are records ready to be coded?
- 4g. Are records electronic? If so, what impact has this had on Coder requirements/tasks?

5. Training:

- 5a. How often is training conducted for Coders or other staff?
- 5b. What training methods are used i.e. coding clinics or record reviews?
- 5c. How are focus/target areas for training identified? Is OIG guidance used? Are high use codes or conditions targeted for training? Are audits or claims rejections used to guide training needs?
- 5d. Are other staff such as providers, billers or medical record technicians included in training sessions? Do these personnel conduct training on their specialty as it relates to medical coding?
- 5e. Are providers given separate code assignment training? If so, is training targeted to certain specialties and codes pertinent to their area or high error/use topics?
- 5f. How are coding staff notified of Coding updates or changes promulgated by Medicare or other agencies?
- 5g. Does the facility pay for required Coder certification maintenance or CEUs? If training material is purchased from vendors, is the material paid for by the facility?

6. Auditing:

- 6a. What type of audits does the facility conduct i.e. record reviews, claims reviews, statistical analysis of code assignment?
- 6b. How often are audits performed?
- 6c. Is auditing software used? If so, what type of software? Does software perform concurrent reviews of coding?
- 6d. Does the facility use external auditors? If so, how often are external audits performed?

6e. What other metrics are used to assess coding accuracy i.e. claims rejections?

7. General Open-ended Questions on Coding Data Quality:

7a. This question is asked to gain insight into what factors the interviewee feels have the most impact on the quality of medical coding data.

7b. This question solicits insight into what changes the interviewee would make to the coding practices at their facility in effort to improve data quality.

7c. This question asks the interviewee to provide insight into the future landscape for medical coding and how future changes may affect coding staff.

Appendix C.

Individual Case Interviews

Table C1.

Facility: Hospital B.	
1. Demographic Information	
1a. Facility Type:	Full Service Tertiary Care Hospital.
1b. Organization Type:	Government
1c. Bed Count:	140 Adult and 32 Bassinet
1d. Type of care provided:	Inpatient, Outpatient, E.R., Primary and Specialty Care. Hosts Family Practice Residency program.
2. Coding Organization Structure	
2a. Centralized/Decentralized:	Centralized.
2b. Are inpatient and outpatient Coders co-located? Yes/No	Yes.
2c. Reporting department/directorate:	Coding belongs to Medical Records under Patient Admin.
2d. Other Functions with HIM Dept.	Transcription, Inpatient Medical Records. Billing also comes under Patient Administration
3. Staffing	
3a. No. of Coders: (FTEs)	7 - INPT Coders and 1 Coder assigned to E.R. (Expect 11 new outpatient coders to help accommodate line item billing).
3b. Are Coders staff or contract?	Staff (GS-06)
3c. Do any Coders code from home?	No
3d. Are coders certified/registered?	No, mostly OJT, Supervisor is a RHIT. Many coders taking college level training and hope to be CCS by next year.
3e. Pre-employment requirements:	Prefer ICD-9 and CPT coding experience but not required
3f. Schedules:	40-hour week M-F. Staggered schedules either 0600-1430 or 0800- 1630

3g. Do Coders code all record types?	Currently Inpatient, SDS, Observation, and E.R. visits are coded. Providers and clinical support staff code primary care and outpatient specialty care in clinics.			
4. Coder Responsibilities				
4a. Productivity/ proficiency Standards:	Yes. Standards require 36 Inpatient Records and 420 outpatient records to be coded per week on average for each coder. The 420 outpatient records is expected to decrease in the near future do to a change in coding requirements.			
How many Rec./Day on average?	OPT: 120	InPT: 24	AP-SDS: 30	ER: 120
4b. Do Coder responsibilities include:				
Abstracting? Yes/No	No. Performed by GS-04 (also send out chart deficiencies)			
Record assembly? Yes/No	No. Performed by GS-04 clerical personnel			
ICD-9 w/CPT & HCPCS? Yes/No	Yes. Performed by GS-06 coders			
4c. Are coding resources readily available?	Yes. Most required coding texts are available including AMA Coding books, Faye Brown coding, Coding Hotline bulletins, ADS Coding guidelines, CPT Assistant, TRICARE ICD-9 guidelines, Merck Manual, PDR			
4d. Type of grouper system employed?	AMS - American Management Systems (DoD Contract)			
4e. Do providers perform initial coding? Are super bills used?	Yes. Providers send a coding message to the coding team and Coder's code from the nomenclatures on the message.			
4f. Record conditions:	Good			
4g. Are records electronic? Yes/No	Papers records are used along with CHCS/KG-ADS			
5. Training				
5a. Frequency and Duration:	Bi-weekly in-service/College Courses. All coding personnel also attend a monthly VTC on HIM, which includes attendees from several facilities.			
5b. Methods used:	In-house training/ Community College			
5c. Focus areas/ Topics:	ICD-9, CPT, Medical Terminology/ E&M code assignment			

5d. Are non-coding staff included in training sessions?	Coding staff and providers are trained separately. However, training for providers by coding staff include clinic personnel who assist providers with ADS. KG-ADS training is also conducted for providers and clinic staff. There is also an e-mail group set up for physician queries to assist providers with coding questions.
5e. Is separate training conducted for providers?	
5f. How is staff notified of code updates?	Disseminated when received from DoD Health Affairs. These are not as timely as preferred.
5g. Does the facility pay for required for certification maintenance or CEUs?	Yes, some training such as seminars and annual AHIMA convention.
6. Auditing	
6a. What Type of coding audits does the facility conduct?	For the DRG/Inpatient Audit the facility's Data Quality Initiative requires auditing 30 records each month. Currently auditing 50 records per month but will be coming in line with the initiative and starting to do 30 soon. The Outpatient audit is done by an RHIA who works for the Chief, Patient Administration
6b. Frequency:	Monthly. See above
6c. Is auditing software used? Yes/No	No. The facility has a staff Statistician that works with a team from Resource Management to audit workload credit, but not E/M or coding. The Statistician does not use auditing software.
6d. Are external auditors used? Yes/No	No.
6e. What other metrics are used to assess coding accuracy?	No specific metrics.
7. General Questions on Data Quality	

7a. What factors do you believe most affect the quality of coding data?	Since codes come directly from diagnoses and procedures, the provider him/herself is possibly the most important factor in getting coding done correctly. It all starts with the patient visit and documentation.
7b. If you could change anything about the coding practices at your facility to improve data quality, what would you change?	Hire enough coders to code from every record for every visit. Providers do not have time nor do they do a good job when it comes to coding.
7c. How do you think medical coding will change in the next 3-5 years? How will these changes affect the Coding profession?	Since coding is only a small facet of the HIM profession, it may eventually be phased into more of a Data Quality role than just an actual "coding" job. Systems are coming or are here now that automatically choose the codes from the electronic patient record, so I see the HIM professional as being a sort of "gatekeeper" and "auditor". I also think that Utilization Management and Peer Review will become even bigger and create more diversified openings in the HIM field.

Table C2.

Facility: Hospital B.	
1. Demographic Information	
1a. Facility Type:	Community Hospital
1b. Organization Type:	Not-for-Profit
1c. Bed Count:	297
1d. Type of care provided:	Inpatient, E.R., Outpatient Ambulatory and Urgent Care
2. Coding Organization Structure	
2a. Centralized/ Decentralized:	Centralized
2b. Are inpatient and outpatient Coders co- located? Yes/No	Yes. Providers code Urgent Care records. Coders Primarily Code hospital records including Inpatient stays, ambulatory surgeries and emergency room visits.
2c. Reporting department/ director:	Coding is a division of Patient Records under the HIM department. The department reports to Administrative Director
2d. Other Functions with HIM Dept.	Patient records and Transcription services
3. Staffing	
3a. No. of Coders: (FTEs)	6-RHIT, 3-CCS
3b. Are Coders staff or contract?	Staff
3c. Do any Coders code from home?	No.
3d. Are coders certified/ registered?	Yes. All coders are either registered health information technicians (RHIT) or certified coding specialists (CCS)
3e. Pre-employment requirements:	Experience is not required however; certification is required.
3f. Schedules:	M-F 40-hour week.
3g. Do Coders code all record types?	Yes. Coders code records for Inpatient stays, ambulatory surgeries and emergency room visits and they provide technical assistance to providers for Urgent Care records.

4. Coder Responsibilities				
4a. Productivity/ proficiency Standards:	No. The facility had Coder productivity standards in the past but has discontinued them temporarily due to a recent change in the facilities coding system (MEDICUS). Standards may again be established once Coders get used to new system. Previous productivity standards were based on record type and approximated the standards below:			
How many Rec./Day on average?	OPT: 100	InPT: 20-25	AP-SDS: 25-30	ER: 100
4b. Do Coder responsibilities include:				
Abstracting? Yes/No	No. Performed by medical record technicians.			
Record assembly? Yes/No	No. Performed by medical record technicians.			
ICD-9 w/CPT & HCPCS? Yes/No	Yes.			
4c. Are coding resources readily available?	Yes. All necessary coding resources are available to coders when coding records.			
4d. Type of grouper system employed?	MEDICUS			
4e. Do providers perform initial coding? Are super bills used?	Providers assign initial codes for urgent care records. Templates are used to assist providers in code selection.			
4f. Record conditions:	Records are ready to be coded when they reach the HIM Department. However, there is often a backlog in transcription and awaiting OP reports.			
4g. Are records electronic? Yes/No	Not yet. Moving in that direction.			
5. Training				
5a. Frequency and Duration:	Initial training is provided to Coders upon employment. Then as needed or identified based on annual audits.			
5b. Methods used:	AHIMA audio seminars, Coding Clinic, one- on-one training.			
5c. Focus areas/Topics:	Not defined, based on needs.			

5d. Are non-coding staff included in training sessions?	No, not generally.
5e. Is separate training conducted for providers?	Infrequently, only as provider's time permits.
5f. How is staff notified of code updates?	Notified at coding staff meetings.
5g. Does the facility pay for required for certification maintenance or CEUs?	No. However, hospital does pay for AHIMA audio seminars and coding clinic courses.
6. Auditing	
6a. What Type of coding audits does the facility conduct?	No set auditing system. Audits of individual coder's are conducted annually as part of annual evaluation. 25-30 each of inpatient and outpatient records are randomly chosen from among each Coder's records. These records are checked to evaluate correct code assignment and that documentation in record supports codes.
6b. Frequency:	Annually
6c. Is auditing software used? Yes/No	No.
6d. Are external auditors used? Yes/No	No.
6e. What other metrics are used to assess coding accuracy?	Claims rejections. Lead Coder reviews all rejected claims.
7. General Questions on Data Quality	
7a. What factors most affect the quality of coding data?	Legible and complete documentation.
7b. If you could change anything about the coding practices at your facility to improve data quality, what would you change?	Not sure.
7c. How do you think medical coding will change in the next 3-5 years? How will these changes affect the Coding profession?	Standardization of code sets, electronic transmission of data, more home coding.

Table C3.

Facility: Hospital C.	
1. Demographic Information	
1a. Facility Type:	Community Hospital
1b. Organization Type:	Government
1c. Bed Count:	134
1d. Type of care provided:	Inpatient, Outpatient, E.R., Primary and Specialty Care. Hosts Family Practice Residency program.
2. Coding Organization Structure	
2a. Centralized/ Decentralized:	Centralized
2b. Are inpatient and outpatient Coders co- located? Yes/No	No.
2c. Reporting department/ director:	Outpatient coding reports to the Business Office under Director of Resources. Inpatient coding reports to Patient Administration under Director for Administration.
2d. Other Functions with HIM Dept.	Transcription. Billing resides in the Business Office with outpatient coding.
3. Staffing	
3a. No. of Coders: (FTEs)	2 - Outpatient Coders, 4 - Inpatient Coders, and 1 Ambulatory Procedure Coder.
3b. Are Coders staff or contract?	Outpatient Coders are Contract employees others are staff.
3c. Do any Coders code from home?	No.
3d. Are coders certified/ registered?	Outpatient coders - Yes. One inpatient Coder is certified, others trained in-house.
3e. Pre-employment requirements:	Not for inpatient coders. Outpatient coder requirements outlined in contract.
3f. Schedules:	Normal M-F 40-hour weeks for all coders.
3g. Do Coders code all record types?	No. Outpatient coders Code only outpatient records with an identified third party payer. Inpatient coders code either inpatient records or ambulatory procedure records.

4. Coder Responsibilities				
4a. Productivity/ proficiency Standards:	None stated or written.			
How many Rec./Day on average?	OPT: 100	InPT: 8	AP-SDS: 8	ER: 100
4b. Do Coder responsibilities include:				
Abstracting? Yes/No	Yes.			
Record assembly? Yes/No	Yes.			
ICD-9 w/CPT & HCPCS? Yes/No	Yes.			
4c. Are coding resources readily available?	Yes. All listed resources are readily available and used.			
4d. Type of grouper system employed?	AMS - American Management Systems (DoD Contract)			
4e. Do providers perform initial coding? Are super bills used?	Coders perform inpatient coding. Providers fill out Super-bills for outpatient visits, clinic staff perform most coding data input.			
4f. Record conditions:	Good overall.			
4g. Are records electronic? Yes/No	No. Papers records are used along with CHCS/KG-ADS.			
5. Training				
5a. Frequency and Duration:	Minimal in-house training for inpatient coders. Outpatient (clinic admin) coders and providers are given 4 hours of initial code training on reference books, E/M codes. Providers are also given a 2-hour intro course in coding during indoctrination training.			
5b. Methods used:	Mainly in-house classroom.			
5c. Focus areas/Topics:	Audits drive training topics. Generally cover E/M coding and documentation.			
5d. Are non-coding staff included in training sessions?	Occasionally. Would like to include Billers and medical record staff in training.			
5e. Is separate training conducted for providers?	Yes. Providers are offered group and individual training.			
5f. How is staff notified of code updates?	Templates are updated as coding changes are announced.			

5g. Does the facility pay for required for certification maintenance or CEUs?	Yes. Once per year for Inpatient Coders.
6. Auditing	
6a. What Type of coding audits does the facility conduct?	Record reviews. Also a spreadsheet is kept for third party insurance claims including ADS sheets and code(s) assigned. The medical records committee reviews records including coding and documentation. Providers are included in this committee providing a training opportunity for providers to understand the importance of proper documentation and code assignment and areas for improvement.
6b. Frequency:	Outpatient clinic are audited once every other month on a rotating basis.
6c. Is auditing software used? Yes/No	No.
6d. Are external auditors used? Yes/No	No.
6e. What other metrics are used to assess coding accuracy?	None.
7. General Questions on Data Quality:	
7a. What factors most affect the quality of coding data?	Provider documentation is critical for coding data to be accurate. Also super-bills must be kept current and free of discrepancies.
7b. If you could change anything about the coding practices at your facility to improve data quality, what would you change?	No comment.
7c. How do you think medical coding will change in the next 3-5 years? How will these changes affect the Coding profession?	Coding will become increasingly automated.

Table C4.

Facility: Hospital D.				
1. Demographic Information		Notes		
1a. Facility Type:	Hospital System.			
1b. Organization Type:	Civilian Not-for-Profit.			
1c. Bed Count:	~700 (licensed for ~900)			
1d. Type of care provided:	Tertiary care (Inpatient, Ambulatory, Emergency, Specialty Care). Hosts Family Practice Residency program.			
2. Coding Organization Structure				
2a. Centralized/Decentralized:	Centralized within each of three facilities			
2b. Are inpatient and outpatient Coders co-located? Yes/No	Yes.			
2c. Reporting department/directorate:	HIM reports to CIO (each facility has HIM section and reports to main HIM Directorate which falls under the CIO)			
2d. Other Functions with HIM Dept.	Transcription and Records Processing (Medical Records, Release of Information etc.).			
3. Staffing				
3a. No. of Coders: (FTEs)	22.6 FTE Coders.			
3b. Are Coders staff or contract?	All Coders are staff employees.			
3c. Do any Coders code from home?	No.			
3d. Are coders certified/registered?	Over half are certified, many learned through OJT.			
3e. Pre-employment requirements:	No.			
3f. Schedules:	Mostly M-F 40 hour weeks however, flex schedules are offered and used by some Coders.			
3g. Do Coders code all record types?	Yes.			
4. Coder Responsibilities				
4a. Productivity/proficiency Standards:	None stated.			
How many Rec./Day on average?	OPT: 100	InPT: 25	AP-SDS: 43	ER: 87
4b. Do Coder responsibilities include:				
Abstracting? Yes/No	Yes.			

Record assembly? Yes/No	No. Done on wards. Ward record order was adopted by coders/medical records rather than re-ordering records within HIM department.
ICD-9 w/CPT & HCPCS? Yes/No	Yes.
4c. Are coding resources readily available?	Yes. Most resources are built into encoder.
4d. Type of grouper system employed?	Quadramed and 3M systems
4e. Do providers perform initial coding? Are super bills used?	No. Super bills not applicable.
4f. Record conditions:	Below average.
4g. Are records electronic? Yes/No	No. Someday most likely.
5. Training	
5a. Frequency and Duration:	Initial training done for coders when hired. Then training is conducted as needed.
5b. Methods used:	Both In-house and external training.
5c. Focus areas/Topics:	Mostly maintenance training as changes occur in coding requirements or rules of coding.
5d. Are non-coding staff included in training sessions?	Not generally. Primarily just the coding staff
5e. Is separate training conducted for providers?	Training on documentation requirements is done through the physician query process.
5f. How is staff notified of code updates?	Coding Clinic, CPT-Assistant, and Medicare updates.
5g. Does the facility pay for required for certification maintenance or CEUs?	Not currently.
6. Auditing	
6a. What Type of coding audits does the facility conduct?	Mainly record reviews.
6b. Frequency:	Annually, 25 records per coder. Each record is checked for proper coding and proper abstracting.
6c. Is auditing software used? Yes/No	No.

6d. Are external auditors used? Yes/No	Yes. Third party payers come in as allowed under their contracts to perform record audits/reviews. Frequency varies and records are specific to carrier patients as opposed to random.
6e. What other metrics are used to assess coding accuracy?	None.
7. General Questions on Data Quality:	
7a. What factors most affect the quality of coding data?	Documentation is definitely the biggest factor that affects coding. Coders can only code what documented in the records.
7b. If you could change anything about the coding practices at your facility to improve data quality, what would you change?	No Comment.
7c. How do you think medical coding will change in the next 3-5 years? How will these changes affect the Coding profession?	More electronic coding and more remote coding.

Table C5.

Facility: Hospital E.	
1. Demographic Information	Notes
1a. Facility Type:	Tertiary Care Hospital
1b. Organization Type:	Government
1c. Bed Count:	500 Beds
1d. Type of care provided:	Full Spectrum Care including Primary, Inpatient, Ambulatory, Specialty, and Emergency Care
2. Coding Organization Structure	
2a. Centralized/Decentralized:	Centralized.
2b. Are inpatient and outpatient Coders co-located? Yes/No	No. Inpatient coding is performed in-house, outpatient coding is performed through a contractor. Outpatient records are sent out of state via Fed-Ex for coding.
2c. Reporting department/directorate:	Coding is organized in the Health Information Department and reports to the Chief Information Officer.
2d. Other Functions with HIM Dept.	Transcription and Release of Information.
3. Staffing	
3a. No. of Coders: (FTEs)	Currently eight Inpatient Coders. One additional vacant position.
3b. Are Coders staff or contract?	Inpatient coders are staff but outpatient coding is contracted out.
3c. Do any Coders code from home?	Not currently
3d. Are coders certified/registered?	Some inpatient coders are but mostly OJT.
3e. Pre-employment requirements:	Not allowed. Recommended structuring applicant interview questions to allow skill assessment i.e. Describe the last time you coded a medical record. What steps did you go through to select the appropriate code assignment(s)?
3f. Schedules:	Typical 40-hour week with flex time schedules allowed including weekends and 10 hour shifts.
3g. Do Coders code all record types?	Inpatient coders code all in-patient record types, outpatient coders code all outpatient, E.R. and ambulatory visits.

4. Coder Responsibilities				
4a. Productivity/ proficiency Standards:	No written standards			
How many Rec./Day on average?	OPT: 100	InPT: 24	AP-SDS: 40	ER: 100
4b. Do Coder responsibilities include:				
Abstracting? Yes/No	Yes.			
Record assembly? Yes/No	No.			
ICD-9 w/CPT & HCPCS? Yes/No	Yes.			
4c. Are coding resources readily available?	Yes, coding resources are readily available to and used by coders. Most resources built into encoder software.			
4d. Type of grouper system employed?	3M system			
4e. Do providers perform initial coding? Are super bills used?	Yes, for outpatient visits super bills are used.			
4f. Record conditions:	Electronic records. For non- electronic records, recommended adopting ward record assembly order rather than re-assembling records in coding department.			
4g. Are records electronic? Yes/No	Yes.			
5. Training				
5a. Frequency and Duration:	As needed. No set schedule.			
5b. Methods used:	System-wide training is conducted			
5c. Focus areas/Topics:	Tailored to needs.			
5d. Are non-coding staff included in training sessions?	Generally not.			
5e. Is separate training conducted for providers?	Only if specific deficiencies are identified.			
5f. How is staff notified of code updates?	During staff meetings and as promulgated by Medicare, coding clinic etc..			

5g. Does the facility pay for required for certification maintenance or CEUs?	Yes. Pays for CEUs but not for travel.
6. Auditing	
6a. What Type of coding audits does the facility conduct?	Record reviews: 10 records per coder per month (Inpatient). 3-5% of outpatient records are reviewed by hospital coding staff to evaluate contractor coding proficiency.
6b. Frequency:	Monthly
6c. Is auditing software used? Yes/No	No.
6d. Are external auditors used? Yes/No	No.
6e. What other metrics are used to assess coding accuracy?	100% of records for new services and records of new employees are initially reviewed until proficiency is established and coders are comfortable with coding.
7. General Questions on Data Quality	
7a. What factors most affect the quality of coding data?	Accurate record documentation (Physician Training)
7b. If you could change anything about the coding practices at your facility to improve data quality, what would you change?	Establish a system of accountability for physicians.
7c. How do you think medical coding will change in the next 3-5 years? How will these changes affect the Coding profession?	Technology will make coding more electronic. More coder's will be coding from home or other off-site work centers.

Table C6.

Facility: Hospital F.				
1. Demographic Information		Notes		
1a. Facility Type:	Community Hospital.			
1b. Organization Type:	Civilian, not-for-profit.			
1c. Bed Count:	190			
1d. Type of care provided:	Inpatient, Ambulatory, Primary and Emergency Care. Hosts Family Practice Residency program.			
2. Coding Organization Structure				
2a. Centralized/ Decentralized:	Centralized.			
2b. Are inpatient and outpatient Coders co-located? Yes/No	Inpatient, Ambulatory, and Emergency Care Coders are collocated. Providers and clinic personnel do primary care coding at clinics. The HIM department does not code these records.			
2c. Reporting department/ director:	HIM department reports to CFO. Billing is separate department under CFO.			
2d. Other Functions with HIM Dept.	Medical records			
3. Staffing				
3a. No. of Coders: (FTEs)	10 full time and 3 part time coders			
3b. Are Coders staff or contract?	All Coders are staff. However, on weekends contract coders are used to help clear backlogs and code E.R. records.			
3c. Do any Coders code from home?	Not currently. Would like to accommodate home coding in future.			
3d. Are coders certified/ registered?	Some. All coders must be certified within two years of employment.			
3e. Pre-employment requirements:	No strict requirements.			
3f. Schedules:	Normal 40-hour week M-F. However, flex-time scheduling is allowed.			
3g. Do Coders code all record types?	Yes.			
4. Coder Responsibilities				
4a. Productivity/ proficiency Standards:	None stated however, goal is to have all records coded within 3 days of receipt of completed record.			
How many Rec./Day on average?	OPT:	InPT:	AP-SDS:	ER:
		26	35	110

4b. Do Coder responsibilities include:	
Abstracting? Yes/No	Yes.
Record assembly? Yes/No	No.
ICD-9 w/CPT & HCPCS? Yes/No	Yes.
4c. Are coding resources readily available?	Yes. Most coding resources are used and readily available.
4d. Type of grouper system employed?	Cascade encoder is used.
4e. Do providers perform initial coding? Are super bills used?	Not for inpatient records. Providers perform their own primary care coding with support provided by clinic personnel.
4f. Record conditions:	Good. Records are scanned into system by clerical staff. Scanned records do not improve legibility of provider handwriting but can be enlarged on screen to improve detail.
4g. Are records electronic? Yes/No	Paper records are scanned into computer.
5. Training	
5a. Frequency and Duration:	One on one training as needed. Training is more frequent for new staff.
5b. Methods used:	Record reviews with Coders.
5c. Focus areas/Topics:	Dependent upon needs.
5d. Are non-coding staff included in training sessions?	No.
5e. Is separate training conducted for providers?	Rarely. Providers are not often available for training.
5f. How is staff notified of code updates?	Through quarterly updates and weekly meetings.
5g. Does the facility pay for required for certification maintenance or CEUs?	Some.
6. Auditing	
6a. What Type of coding audits does the facility conduct?	Record audits are conducted on each coder to gauge proficiency.
6b. Frequency:	Twice yearly
6c. Is auditing software used? Yes/No	MEDSTAT is used as tool to compare coding trends with other facilities.

6d. Are external auditors used? Yes/No	Yes. An outside auditor conducts a coding audit every other year.
6e. What other metrics are used to assess coding accuracy?	Claims edits/rejections.
7. General Questions on Data Quality	
7a. What factors most affect the quality of coding data?	Provider documentation and handwriting.
7b. If you could change anything about the coding practices at your facility to improve data quality, what would you change?	More provider involvement and understanding of documentation needs.
7c. How do you think medical coding will change in the next 3-5 years? How will these changes affect the Coding profession?	More automation. More coders will be able to code from alternative work sites.

Appendix D.

Decision Matrix

Evaluation of Recommended Actions vs. Status Quo

Each of the recommended actions for this study was evaluated and subjectively scored against the status quo based on two criteria - organizational impact (OI) and coding quality impact (CQI) - to establish a basis for decision-making. The OI scores are negative and reflect the estimated qualitative cost/impact of change that would result from implementation of recommendations. The CQI scores are positive and reflect estimated improvements in the quality of medical coding data that would result from implementation of recommendations. Scores are based on the level of impact and the estimated timeframe that the impact is expected to occur/last. A net impact (NI) score, derived from adding the OI and CQI scores together, is also given for each recommendation. A positive NI score supports the recommended action; a negative NI score supports the status quo.

Scoring methodology:

Organizational impact of recommended action vs. status quo

- 1 - Minimal organizational impact
- 2 - Moderate, short-term organizational impact (< 1 year)
- 3 - Moderate, long-term organizational impact (> 1 year)
- 4 - High, short-term organizational impact (< 1 year)
- 5 - High, long-term organizational impact (> 1 year)

Coding quality impact of recommended action vs. status quo

- 5 - High, results expected within a short time frame (< 6 months)
- 4 - High, results expected to take a long time (> 6 months)
- 3 - Moderate, results expected within a short time frame (< 6 months)
- 2 - Moderate, results expected to take a long time (> 6 months)
- 1 - Minimal impact on quality of medical coding data

Status Quo	Recommended Action	Impact of Recommended Action vs. the Status Quo Alternative
Inpatient coding, outpatient coding, and medical records are located on separate floors in different areas of the hospital.	Consolidate inpatient and outpatient coding and combine with medical records to form a single health information management (HIM) division. OI score: -4 CQI score: 3	Organizational Impact: <ul style="list-style-type: none"> Requires physical relocation of the sole outpatient coder. Although the recommended action also requires the relocation of inpatient coders, the effect should be minimal because these personnel have already been temporarily relocated to accommodate a renovation project. The medical records division will lose some office space due to the consolidation. However, this will be partially offset by other moves out of medical records spaces as part of a planned organizational re-alignment.

		<p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • Brings coders in close proximity to medical records, which serve as the primary source of health information data used for coding. • Removes the distance barrier to improving coding quality by giving coders ready access to medical records for coding and for record audits.
<p>Outpatient coding is performed within the business office away from all clinics.</p>	<p>Decentralize outpatient coders by placing them in clinics. Outpatient coding supervisor would remain in HIM division spaces.</p> <p>OI score: -1 CQI score: 5</p> <p>NI score: 4</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • Requires clinic space for coders. This should have minimal impact on clinics however, because recent facility renovations have substantially increased clinic spaces.
		<p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • Facilitates on-site training for providers by coding staff to correct coding deficiencies on the spot. • Allows coder's to code records before they leave clinics to be returned to medical records. • Reduces space requirements in medical records area.
<p>Inpatient coding and medical records are separate divisions belonging to patient administration department under the director for administration/operations (DFA/O). Outpatient coding belongs to the business office under the director of resources.</p>	<p>Place the HIM function within the patient administration department under the DFA/O.</p> <p>OI score: -2 CQI score: 3</p> <p>NI score: 1</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • There may be costs associated with organizational change. • Moves outpatient coding from one organizational entity to another causing a shift in responsibilities that could have human resource costs due to changes in position descriptions.
		<p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • Reinforces coding as a clinical/administrative function designed to accurately describe patient care services and the level of effort expended in care delivery. • Improves the quality of medical coding by alleviating potential influence or pressure felt by coders to focus on financial matters when assigning codes. • Aligns coding and medical records under the DFA/O. This will keep the coding function in the same directorate as the management information department, which may be beneficial during NHB's transition to computerized patient records.

<p>One trained outpatient coder performs all outpatient coding. This coder is also responsible for all coding procedures training for physicians, and or conducting all outpatient coding audits.</p>	<p>Add five to six additional trained outpatient coders either through new hires or contract personnel.</p> <p>OI score: -5 CQI score: 4</p> <p>NI score: -1</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • \$36,688 annually per GS-6 coder. \$50,000 - \$60,000 annually per contract coder. • Additional workload/responsibilities placed on outpatient coding supervisor. <p>Total costs could range from \$185,000 to \$360,000 annually.</p> <p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • Allows up to 144,000 additional records to be coded by trained coders each year. This will be increasingly important when line item billing begins, which will further increase coder workload and require greater coding skills than the current billing system. • Having records coded by trained coders may reduce claim rejections due to improper coding and may potentially increase third party collections. • Hiring additional coders will expand the capacity to provide coding consultation and training to providers and clinical support staff.
<p>There are five inpatient coders in addition to the inpatient coding supervisor.</p>	<p>Convert three of NHB's inpatient coders to outpatient coders.</p> <p>OI score: -2 CQI score: 4</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • Inpatient coders would require training in outpatient coding procedures. The current outpatient coder/trainer can accommodate this requirement. • The reduction in inpatient coding staff will require changes in per coder workload for inpatient coding staff and may also require some process modifications to improve coder productivity. • Initial costs related to employee resistance to change.

		<p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • Similar to those associated with new hires. • The additional training may be attractive to inpatient coders. Because these coders will be trained in both inpatient and outpatient coding, they will be more valuable assets to the facility. • Coders can fluctuate between inpatient and outpatient coding when workload dictates, which may allow a smoother transition to a reduced inpatient coding staff and help attenuate initial apprehension to change. • If outpatient coders work within clinics, as recommended, office space requirements within the medical records area will be further reduced.
Inpatient coders perform record assembly, physician queries, and all record abstracting.	<p>Add additional clerical staff to inpatient coding to take over some non-coding tasks including record assembly and preparation for coding, initial record abstracting, and physician queries.</p> <p>OI score: -1 CQI score: 3</p> <p>NI score: 2</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • There should be minimal costs involved with this recommended action. The clerical duties do not require a significant amount of training and may be accomplished using current clinic, ward, or medical record personnel. <p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • Increases inpatient coder productivity by allowing coders to focus their efforts on coding alone. This action adopts a practice employed by many of the coding departments visited for this study. • Alleviates some of the inpatient coder duties. This may help attenuate the transition to a smaller inpatient coding section. • Indirectly improves coding data quality by supporting the conversion of three inpatient coders to outpatient coders, which directly impacts the quality of outpatient coding.
Outpatient coder unable to fully perform all assigned duties due to insufficient staffing. Inpatient coding supervisor codes records with little effort aimed at process	<p>Redefine coding staff responsibilities to accommodate new organizational design and staffing changes. Emphasis is on training, auditing, and other program/process improvement activities by supervisors and staff.</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • There are minimal costs associated with this recommended action.

		<p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • Provides for a more proactive coding program focusing on training, auditing, and process improvement aimed at improving coding data quality. • The recommended action mainly affects the inpatient and outpatient coding supervisor roles. By removing most of their coding responsibilities, supervisors will be able to devote more time to training, auditing and other process/program improvement activities. • Increases non-supervisory coding staff involvement in training providers and clinical support staff in proper coding and documentation procedures.
There is no formal training plan designed to train physicians on inpatient coding and documentation	<p>Develop training plans specifically designed to address inpatient coding and documentation requirements.</p> <p>OI score: -2 CQI score: 3</p> <p>NI score: 1</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • Requires time and effort to initially develop and implement inpatient coding training plans. • Requires physician and clinical/ward support staff time to attend training. <p>Coding Quality Impact:</p> <ul style="list-style-type: none"> • May reduce unnecessary coder time spent contacting physicians to correct documentation errors or omissions, to clarify services, and to re-order and assemble records. • Having records ready for coding when they reach the coders may decrease per record coding time. • The sooner records are coded after patient discharge, the better the likelihood that physicians will recall circumstances of the patient's care. • The sooner a record is coded, the sooner a bill for services, if applicable, can be processed for reimbursement.
Physicians who desire training on documentation and coding attend training sessions. There are no mandatory coding/documentation training sessions and no consequences for physicians who do not	<p>Increase leadership involvement in emphasizing the importance of improving the quality of medical documentation and coding.</p> <p>OI score: -3 CQI score: 5</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> • Additional provider time spent in coding and documentation training sessions. • Minimal cost, if any, for leadership.

		<p>Coding Quality Impact:</p> <ul style="list-style-type: none"> Increased awareness of the importance of accurate medical coding and documentation by providers. Providers are the key to improving the quality of medical coding data. Provider's active participation and efforts toward improving the quality of medical coding data will have a significant impact on the quality of coding data.
Insufficient sample size for audits. No statistical basis/foundation for audits. Audits are done monthly. Outpatient record sample drawn from only one clinic each month.	<p>Increase the sample size for record audits and reduce audit frequency.</p> <p>OI score: -3 CQI score: 4</p> <p>NI score: 1</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> Requires additional coder time to conduct audits. <p>Coding Quality Impact:</p> <ul style="list-style-type: none"> Audits will more precisely measure coding accuracy and the effect that interventions, such as training, have on improving coding data quality. Obtaining a more accurate measure of coding accuracy can strengthen the validity of decisions based on audit results and reduce the likelihood of making decisions based upon inaccurate audit results.
Audits only include percentage of records with coding errors.	<p>Capture more detailed information when conducting record audits to maximize the use of audit results.</p> <p>OI score: -2 CQI score: 3</p> <p>NI score: 1</p>	<p>Organizational Impact:</p> <ul style="list-style-type: none"> Requires additional coder time to conduct audits. <p>Coding Quality Impact:</p> <ul style="list-style-type: none"> Allows an auditor to measure multiple characteristics of patient care, the patient population, and variations in treatment from a single audit. Audits would support several uses of medical coding data such as physician profiling, population health, and quality assurance and quality improvement initiatives having organization wide benefits.

Consolidated NI score: 15